

360iResearch

Motion Positioning Stages Market

Global Forecast 2026-2032

MRR-F3183FD143B9 | October 2026

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1. Preface

1.1. Objectives of the Study

- Which documented stage offerings and supplier relationships participate in the Global Motion Positioning Stages market, and how should advertised, announced, and commercially supplied activity be distinguished?
- How do stage configuration, actuation, drive, guidance, feedback, and control integration align with the different requirements of Equipment OEMs, Independent System Integrators, and Direct Operators?
- Which buyer qualification, operating-environment documentation, integration, and support requirements affect supplier selection, and what must be established before treating an alternative stage as a substitute?
- How do catalog, configured-to-order, and custom-engineered offerings allocate responsibility for drives, controls, integration, intellectual property, and lifecycle support, and what consequences follow for buyer dependency and switching?
- What manufacturer, distributor, reseller, licensing, territorial, and service commitments establish commercial access, and which product- and jurisdiction-specific conditions must be verified before choosing a route to customers?
- What evidence connects the included applications and end-user sectors to purchasing decisions, adoption conditions, and qualitative buyer economics without assuming that category inclusion proves demand?
- Which documented differences in supplied capability, delivery responsibility, qualification, and customer support distinguish competing stage offerings, and where do unresolved facts prevent a defensible competitive comparison?

1.2. Market Definition

The Global Motion Positioning Stages market covers identifiable stage assemblies for linear, rotary, angular, or combined positioning. It includes standard catalog, configured-to-order, and custom-engineered stages, including stage offerings supplied for integration into larger equipment. Buyers are Equipment OEMs, Independent System Integrators, and Direct Operators across the accepted end-user sectors.

The offering boundary includes manual, electrically actuated, pneumatically actuated, hydraulically actuated, drive-ready, and mixed-actuation stages. It also includes stages without installed drive mechanisms or control electronics. The accepted guidance, feedback, and control architectures are characteristics of these offerings, not requirements that every stage must share. Standard-environment, single-environment qualified, and combined-environment qualified stages are all included.

Upstream motors, bearings, sensors, controllers, software, and other components provide value-chain context but do not become stage offerings solely because they support positioning. Complete machines, instruments, and other downstream equipment are demand

and integration contexts; their entire commercial activity is not interchangeable with the identifiable stage they incorporate. Distribution and integration relationships inform access and responsibility without expanding the offering boundary to every product or service a participating business supplies.

1.3. Market Segmentation & Coverage

Stage Configuration distinguishes Single-Axis Linear Stages, Single-Axis Rotary Stages, Single-Axis Goniometer and Tilt Stages, Multi-Axis Translation Stages, Multi-Axis Angular Stages, and Combined Translation-Angular Stages. This axis organizes the supplied positioning arrangement. Actuation Mode separately covers Manual Stages, Electrically Actuated Stages, Pneumatically Actuated Stages, Hydraulically Actuated Stages, Drive-Ready Stages, and Mixed-Actuation Stages, preserving offerings with different actuation responsibilities.

Drive Mechanism covers Screw Drives; Belt and Cable Drives; Rack-and-Pinion Drives; Rotary Gear Drives; Friction-Roller Drives; Direct Electromagnetic Drives; Direct Piezoelectric Drives; Fluid-Pressure Drives; Cam, Wedge, and Linkage Drives; Stages Without Installed Drive Mechanisms; and Hybrid and Mixed Drives. Direct Piezoelectric Drives retains the subordinate categories Piezoelectric Deformation Drives and Piezoelectric Motor Drives. These categories distinguish stage offerings by their documented drive arrangement without treating the upstream drive alone as the studied product.

Guidance Technology covers Sliding-Bearing Stages, Ball-Bearing Stages, Roller-Bearing Stages, Flexure-Guided Stages, Air-Bearing Stages, Liquid-Hydrostatic-Bearing Stages, Magnetically Levitated Stages, and Mixed-Guidance Stages. Feedback Architecture covers Open-Loop and Non-Servo Stages, Actuator-Side Closed-Loop Stages, Load-Side Closed-Loop Stages, Dual-Position-Feedback Stages, and Mixed-Feedback Systems. These are separate comparison lenses; neither a guidance category nor a feedback label establishes complete product equivalence.

Application covers Alignment & Coupling; Imaging & Microscopy; Metrology, Calibration & Inspection; Material Processing & Patterning; Assembly & Precision Handling; and Testing & Characterization. This axis identifies the task served by a stage rather than the institutional identity of its buyer.

End-User Sector covers Manufacturing, Research & Technical Services, Education, Healthcare Services, Public Administration & Defense, and Utilities & Environmental Services. Purchasing Role separately distinguishes Equipment OEMs, Independent System Integrators, and Direct Operators. Keeping these axes separate allows a purchasing relationship to be examined without assuming that the purchaser and eventual operator occupy the same sector.

Control Integration covers Onboard Control Electronics, External Control Electronics, Combined Onboard and External Control Electronics, and Stages Without Control Electronics. Customization Level covers Standard Catalog Stages, Configured-to-Order Stages, and Custom-Engineered Stages. Together, these lenses organize questions about the supplied package and the division of integration and delivery responsibilities, rather than presuming that every stage is a complete controlled system.

Sales Channel distinguishes Direct Manufacturer Sales from Distributor and Reseller Sales. Operating Environment covers Standard-Environment Stages, Single-Environment Qualified Stages, and Combined-Environment Qualified Stages. These axes support examination of customer access and the documented scope of environmental qualification without making category inclusion conditional on a preferred channel or operating context.

All axes apply within the Global market boundary and are independent views of the same studied activity, not additive opportunities. Inclusion establishes coverage; it does not establish a particular supplier's capability, local availability, buyer acceptance, or commercial attractiveness.

Table 1. Global Motion Positioning Stages Market Segmentation & Coverage

Segmentation	Coverage
Actuation Mode	• Electrically Actuated Stages • Drive-Ready Stages • Manual Stages • Pneumatically Actuated Stages • Mixed-Actuation Stages • Hydraulically Actuated Stages
Application	• Material Processing & Patterning • Assembly & Precision Handling • Metrology, Calibration & Inspection • Testing & Characterization • Imaging & Microscopy • Alignment & Coupling
Control Integration	• External Control Electronics • Stages Without Control Electronics • Onboard Control Electronics • Combined Onboard and External Control Electronics
Customization Level	• Configured-to-Order Stages • Standard Catalog Stages • Custom-Engineered Stages
Drive Mechanism	• Screw Drives • Direct Electromagnetic Drives • Fluid-Pressure Drives • Direct Piezoelectric Drives o Piezoelectric Deformation Drives o Piezoelectric Motor Drives • Belt and Cable Drives • Hybrid and Mixed Drives • Rotary Gear Drives • Stages Without Installed Drive Mechanisms • Cam, Wedge, and Linkage Drives • Rack-and-Pinion Drives • Friction-Roller Drives

Table 1 - continued

Segmentation	Coverage
End-User Sector	• Manufacturing • Research & Technical Services • Education • Healthcare Services • Public Administration & Defense • Utilities & Environmental Services
Feedback Architecture	• Load-Side Closed-Loop Stages • Actuator-Side Closed-Loop Stages • Open-Loop and Non-Servo Stages • Dual-Position-Feedback Stages • Mixed-Feedback Systems
Guidance Technology	• Ball-Bearing Stages • Roller-Bearing Stages • Flexure-Guided Stages • Air-Bearing Stages • Sliding-Bearing Stages • Mixed-Guidance Stages • Liquid-Hydrostatic-Bearing Stages • Magnetically Levitated Stages
Operating Environment	• Standard-Environment Stages • Single-Environment Qualified Stages • Combined-Environment Qualified Stages
Purchasing Role	• Equipment OEMs • Direct Operators • Independent System Integrators
Sales Channel	• Direct Manufacturer Sales • Distributor and Reseller Sales
Stage Configuration	• Single-Axis Linear Stages • Multi-Axis Translation Stages • Combined Translation-Angular Stages • Single-Axis Rotary Stages • Multi-Axis Angular Stages • Single-Axis Goniometer and Tilt Stages

Sources & Evidence

1. IIT Delhi - Multiaxes Precision CNC Stage for Femtosecond Laser Micromachining System

   · Taxonomy evidence: The institutional tender published August xx.xx 2024 requests one integrated stage system containing X, Y, and Z positioning plus a rotary B axis. This directly supports combined translation-angular complete-stage demand, not an awarded contract or realized sale. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

   · Taxonomy evidence: The same procurement requires a control panel separate from the CNC stages and places all automation components except motors, including servo drives and the controller, in that panel. This establishes expressly external control-electronics packaging for the requested stage system. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

   · Taxonomy evidence: The institutional tender specifies supply and integration of a complete positioning-stage system for laser micromachining and expressly excludes the laser source and beam-delivery system. This directly supports stage-attributable material-processing demand rather than whole-machine revenue. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

   · Taxonomy evidence: The specified installation and institutional-use destination establish an educational purchaser and intended operator; the tender does not prove completed delivery. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

   · Taxonomy evidence: The institution seeks a stage for integration into equipment at its own site. This demonstrates direct-operator procurement even though the supply contract includes integration responsibilities. OEMs and authorized dealers mentioned as bidders are suppliers, not the buyer role. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

2. Development of Combined Microstructure and Structure Characterization Facility for In Situ and Operando Studies at the Advanced Photon Source

   · Taxonomy evidence: The 2018 institutional research paper describes an angularly encoded rotation stage coupled through worm gearing to a stepping motor, separately from later direct-drive replacements. It independently establishes a geared rotary-stage use distinction, but not a current offering or a 2025 merchant-stage transaction. ([tsapps.nist.gov](https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=xx.xx))

3. Edmund Optics - 60mm Travel, X-Axis Rack & Pinion Stage

   · Taxonomy evidence: The inspected product-specific commercial listing identifies a complete X-axis stage with dovetail guidance and rack-and-pinion drive, separately specifying movement, guide system, and drive. This establishes the seller's own offering only, not an exhaustive taxonomy, independent buyer adoption, or historical 2025 availability. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))

4. Zaber - RSM-E Motorized Rotation Stages, Built-in Motor Encoders

   · Taxonomy evidence: The inspected RSM-E product page explicitly identifies worm-gear-driven motorized rotation stages and presents a purchasable stage model. This is current own-offering corroboration of geared rotary supply, not proof of 2025 sales, market-wide prevalence, or the configured position-servo loop. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

5. Indian Institute of Science - Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly

   · Taxonomy evidence: The November xx.xx 2025 tender specifies piezoelectric actuation for X and Y and manual screw adjustment for Z, establishing different supplied actuation provisions. The requirement does not identify the powered axes' final transmission. Analytical consequence: it cannot independently verify allocation to different drive-mechanism peers merely from the actuator labels. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Global-Tender_XYZ_stage_piezo-xx.xx.pdf))

   · Taxonomy evidence: The full-assembly tender specifies XYZ positioning, with piezo actuation for X and Y and a manual screw-gauge Z adjustment.

   · Taxonomy evidence: The requested assembly combines powered piezo positioning with a separately manual positioning axis, establishing a genuine mixed-actuation purchase configuration.

   · Taxonomy evidence: Piezo positioning elements and a screw-gauge positioning element are specified within the same complete stage assembly, supporting a mixed-mechanism allocation rather than separate finished-stage counts.

6. Indian Institute of Science - Request for Quote for Supply of Closed-Loop Cryogenic Nanopositioning System

   · Taxonomy evidence: The June xx.xx 2025 RFQ requests a cryogenic positioning system and lists ultrahigh-vacuum compatibility as an option and a nonmagnetic construction variant. It establishes selectable combined environmental requirements, not the exact variant ultimately ordered, completed qualification, or delivery. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

   · Taxonomy evidence: The requested cryogenic nanopositioning system includes vacuum and nonmagnetic compatibility requirements or options. This supports preserving combined profiles, while not establishing which options were ultimately ordered or delivered. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

   · Taxonomy evidence: The procurement explicitly permits quotations from an Indian original equipment manufacturer or its authorized Indian distributor. This provides dated 2025 demand-side corroboration of manufacturer and distributor selling roles, without establishing an awarded channel or title-taking terms. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

   · Taxonomy evidence: The June xx.xx 2025 buyer RFQ specifies cryogenic-stage compatibility, an ultrahigh-vacuum option, and a nonmagnetic variant within one procurement, demonstrating that environmental requirements can coexist. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

7. U. R. Rao Satellite Centre - Tender for 6-Axis Positioning System, URSC/CE/IS202500012301

   · Taxonomy evidence: The October xx.xx 2025 public tender identifies a six-axis Stewart-platform/hexapod positioning system and separately lists the platform, controller and accessories, and installation-related supply. This corroborates procurement of an integrated multi-axis stage offering rather than treating each constituent axis as a separate finished-stage purchase. The tender is not an award record. ([eproc.isro.gov.in](https://eproc.isro.gov.in/viewDocumentPT?tenderId=IS202500012301))

8. ISO 230-2:2014 - Test Code for Machine Tools - Part 2: Determination of Accuracy and Repeatability of Positioning of Numerically Controlled Axes

   · Taxonomy evidence: The official record identifies ISO xx.xx-xx.xx:2014 as confirmed in 2025 and describes its scope as positioning accuracy and repeatability evaluation for numerically controlled machine-tool axes. Analytical implication: these measurement concepts do not classify engineering customization and do not, by themselves, establish commercial price or quality tiers. ([iso.org](https://www.iso.org/standard/xx.xx.html))

   · Taxonomy evidence: The standard's stated scope concerns accuracy and repeatability evaluation of numerically controlled machine-tool axes. Analytical implication: those measurements are distinct from customization level and do not establish the omitted market-wide commercial performance tiers. ([iso.org](https://www.iso.org/standard/xx.xx.html))

9. IIT Hyderabad - Supply of Linear Stage, Single Tender IITH/PHY/YOGESH/2023/S/T090

   · Taxonomy evidence: The February xx.xx 2024 procurement separately specifies single-X-axis linear stages, electric stepper motors, metric lead screws, and a recirculating-ball guide, supporting separation of configuration, actuation, transmission, and guidance.

   · Taxonomy evidence: The purchase requirements identify linear stages with X as the active positioning axis.

   · Taxonomy evidence: The requested linear stages specify two-phase stepper-motor actuation.

   · Taxonomy evidence: Metric lead screws are explicitly identified separately from the stepper motors.

   · Taxonomy evidence: The longer-travel stage requirement explicitly identifies a recirculating-ball-bearing guide.

   · Taxonomy evidence: Separate motor, screw, and guide fields establish that motive power is not interchangeable with transmission or bearing classification.

10. IISER Berhampur - Notice Inviting Tender IISERBpr/S&P/2024-25/06
    - Taxonomy evidence: The May xx.xx 2024 requirements separately list goniometers, a manual rotation stage, a manual translation stage, and a two-axis tip-tilt platform.
    - Taxonomy evidence: The tender requests a manual rotation stage with continuous angular movement and engraved graduations.
    - Taxonomy evidence: Separate goniometer line items specify angular positioning about an elevated point of rotation.
    - Taxonomy evidence: The tip-tilt platform requirement identifies two active angular axes; its bundled mirror does not establish a separately attributable stage value.
    - Taxonomy evidence: Manual translation and manual rotation stages appear as distinct purchasable requirements.
    - Taxonomy evidence: The tip-tilt specification distinguishes open-loop and closed-loop performance, while the manual-stage line items establish non-servo positioning purchases.
    - Taxonomy evidence: The tip-tilt purchase requirement specifies integrated strain-gauge sensing and distinguishes closed-loop from open-loop positioning.
11. Indian Institute of Science - Tender Notification for the Procurement of 3-Axis Piezo Stage for Microscopy
    - Taxonomy evidence: The November xx.xx 2017 procurement requests one three-axis piezo stage with X, Y, and Z active axes.
    - Taxonomy evidence: The requested piezo stage is a complete positioning purchase with an integrated capacitive sensor and closed-loop travel requirements.
    - Taxonomy evidence: The procurement establishes demand for an electrically actuated piezo stage, without independently specifying its final transmission subtype.
12. Cost and Performance Trade-Offs for Commercially Available Linear Stages
    - Taxonomy evidence: The academic comparison classifies commercially available manual linear stages by their bearing principles; its sample is not a complete Global market partition.
    - Taxonomy evidence: Dovetail stages are identified as a commercial sliding-contact stage class.
    - Taxonomy evidence: Ball-bearing and gothic-arch ball-bearing stages are identified among the commercial stage classes studied.
    - Taxonomy evidence: Crossed-roller stages are treated separately from ball-bearing stages.
    - Taxonomy evidence: Flexure stages are identified as a distinct commercially available guidance class.
13. Dynamic Modelling of a Single-Axis Belt-Drive System
    - Taxonomy evidence: The peer-reviewed article identifies belt-driven positioning stages as an industrial positioning family and distinguishes them from lead- or ball-screw stages. It does not establish cable-stage coverage.
    - Taxonomy evidence: Its described belt-driven stage uses a geared DC motor, illustrating that the input motor and the platform transmission are different classification facts.
14. Precision Positioning Which Contains Flexible Mechanical System - Fusion of Semi-Closed and Full-Closed Loop Control
    - Taxonomy evidence: The paper distinguishes motor-angle, load-angle, and combined positioning feedback architectures.
    - Taxonomy evidence: Semi-closed positioning control is defined using motor-angle information.
    - Taxonomy evidence: Full-closed positioning control is distinguished by load-angle feedback.
    - Taxonomy evidence: The study combines motor-side and load-side position information; it establishes an engineering architecture, not a marketed complete-stage transaction.
15. MISUMI - Motorless Stages: Z-Axis Level Cross Roller Guide
    - Taxonomy evidence: The supplier catalog explicitly presents motorless Z-axis stages and distinguishes them from products supplied with motors.
    - Taxonomy evidence: The motorless product's commercial specification separately identifies its ball screw, showing that absence of a motor does not mean absence of a transmission.
    - Taxonomy evidence: The catalog identifies crossed-roller guidance for its motorless Z-axis stage.

16. Air-Hydraulics - Rotary Indexing Table
    - Taxonomy evidence: The supplier brochure advertises complete pneumatic rotary indexing tables and states that their indexing movement does not require electric motors.
    - Taxonomy evidence: The brochure lists hydraulic-powered indexing as an option for its Model xx.xx; this establishes an own-product option, not universal industrial-table inclusion.
    - Taxonomy evidence: The advertised positioning tables specify tapered-roller-bearing construction.
    - Taxonomy evidence: The brochure presents externally supplied rotary indexing tables as complete products. Their eligibility remains subject to the positioning-versus-conveyance boundary.
17. ABTech - Oil Hydrostatic Linear Stages
    - Taxonomy evidence: ABTech advertises oil-hydrostatic linear stages as standalone units or multi-axis assemblies, establishing an own-product complete-stage offering.
    - Taxonomy evidence: The stage page separately describes hydrostatic guidance and integrated linear motors, supporting independence of guidance from motive drive.
    - Taxonomy evidence: The supplier identifies linear motors and encoders integrated with controls for its hydrostatic stage offering.
18. PI - Linear Translation Stages and NanoPositioners Overview
    - Taxonomy evidence: PI's own stage overview describes magnetic linear-motor stages with air-bearing guidance.
    - Taxonomy evidence: The overview separately describes magnetic-levitation guidance. This presentation alone does not establish an external sale or distinguish every offering from a demonstrator.
    - Taxonomy evidence: PI describes its piezo-linear-motor positioning offerings as avoiding drive screws and gears, supporting an own-offering direct-piezo mechanism distinction.
    - Taxonomy evidence: The page identifies piezo linear motors separately from rotary stepper and servo motors in its positioning-stage offering.
    - Taxonomy evidence: Magnetic linear motors are identified as a drive option for PI's translation stages, separately from their guidance.
19. Six Degree of Freedom Fine Motion Positioning Stage Based on Magnetic Levitation
    - Taxonomy evidence: The NASA-hosted 1994 paper describes a magnetically suspended six-degree-of-freedom positioning platform. It establishes the named technical family, not current commercial availability.
20. Investigation of the Microscopic Performance of an Aerostatic Precision Positioning Stage Driven by the Air-Lubricated Friction Drive
    - Taxonomy evidence: The engineering paper explicitly studies a precision positioning stage driven by a friction drive; it does not establish a merchant-stage transaction.
    - Taxonomy evidence: The same stage is identified as aerostatic, demonstrating that the guidance principle is distinct from its friction-drive mechanism.
21. Progress of Mechanical Design of Nanopositioning Stages at the Advanced Photon Source
    - Taxonomy evidence: The institutional manuscript describes a flexure rotation stage mounted on a bearing rotation stage, establishing a mixed-guidance architecture. The research implementation does not independently establish external commercial supply.
22. Global tender for a manual waveguide alignment rig
    - Taxonomy evidence: The October xx.xx 2022 institutional tender requests an integrated manual waveguide-alignment assembly containing input, central, and output positioning stages for optical coupling. This establishes an alignment-stage procurement category, not an award or realized sale. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Taxonomy evidence: The procurement is issued by an educational institution for its own optics work, providing buyer-side evidence relevant to Education rather than inferring the buyer sector from a supplier's customer list. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))

23. JPL Robotics: The Computer Vision Laboratory

- Taxonomy evidence: The institutional facility description identifies an optical bench with translation stages used to acquire image sequences with controlled camera or object motion. It establishes imaging use, without establishing a stage purchase date, merchant-stage value, or deployment volume. ([robotics.jpl.nasa.gov](https://robotics.jpl.nasa.gov/how-we-do-it/facilities/the-computer-vision-laboratory/))

24. Dimensional nano and sub nanometrology

- Taxonomy evidence: The national metrology institution describes stage metrology and high-precision scanning stages used in metrological atomic force microscopy, establishing a dimensional-metrology use distinct from image acquisition alone. ([npl.co.uk](https://www.npl.co.uk/research/dimensional/nano-and-sub-nanometrology))
- Taxonomy evidence: The page documents an institution performing research and measurement activities involving positioning stages. This supports research-and-technical-service use, but not a particular establishment code, procurement amount, or sector share. ([npl.co.uk](https://www.npl.co.uk/research/dimensional/nano-and-sub-nanometrology))

25. Multi-Probe Micro-Assembly

- Taxonomy evidence: The 2007 institutional study identifies commercial nanopositioning stages within microassembly equipment. It establishes assembly and manipulation as stage-use categories, not a newly commercialized stage product, present deployment prevalence, or 2025 sales. ([tsapps.nist.gov](https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=xx.xx))

26. Facility Equipment - MIRIAM/B22

- Taxonomy evidence: The operational infrared imaging and microspectroscopy facility lists sample-positioning stages in its analytical end stations. This establishes stage-enabled analytical characterization, while the complete instruments and facility value remain outside stage revenue. ([diamond.ac.uk](https://www.diamond.ac.uk/Instruments/Soft-Condensed-Matter/B22/status.html))
- Taxonomy evidence: The facility's own equipment inventory provides operator-side evidence of positioning-stage use in a dedicated scientific setting. It does not disclose a separate stage transaction or establish an official establishment classification. ([diamond.ac.uk](https://www.diamond.ac.uk/Instruments/Soft-Condensed-Matter/B22/status.html))

27. UNSD Classification Detail - ISIC Rev.4, Section C: Manufacturing

- Taxonomy evidence: The official manufacturing section encompasses physical or chemical transformation and assembly of manufactured products. Its listed divisions include electronic and optical products, electrical equipment, machinery, transportation equipment, chemicals, and pharmaceuticals. This supports sector definition only, not stage adoption or sales. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/C))

28. UNSD Classification Detail - ISIC Rev.4, Division 72: Scientific research and development

- Taxonomy evidence: The official scientific-R&D division distinguishes research and development activities as an economic activity, supporting classification of dedicated research establishments separately from their funding source or research subject. It does not establish stage purchasing. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/xx.xx))

29. UNSD Classification Detail - ISIC Rev.4, Division 71: Architectural and engineering activities; technical testing and analysis

- Taxonomy evidence: The official classification identifies engineering services and technical testing and analysis as economic activities. This supports the technical-service portion of the combined sector without treating every internal industrial laboratory as an independent service establishment. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/xx.xx))

30. UNSD Classification Detail - ISIC Rev.4, Division 86: Human health activities

- Taxonomy evidence: The official human-health division defines healthcare-service activities, including hospitals and medical practices. This supplies a sector boundary but does not establish eligible stage procurement, regulatory authorization of a stage, or current healthcare adoption. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/xx.xx))

31. UNSD Classification Detail - ISIC Rev.4, Section O: Public administration and defence; compulsory social security

· Taxonomy evidence: The official classification states that institutional or legal status alone does not determine public-administration classification: publicly operated activities classified elsewhere remain in their respective sectors. This supports activity-based end-user allocation rather than assigning every public buyer to government. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/O))

· Taxonomy evidence: The section includes public administration, national defense, and public-order functions, while distinguishing teaching and healthcare activities. This establishes the proposed sector boundary, not a verified stage purchase by that sector.
([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/O))

32. Berkeley Lights, Inc. - 2022 Annual Report

· Taxonomy evidence: The 2022 annual report identifies motion stages among third-party-supplied components used to manufacture the company's systems. This is buyer-side evidence of equipment-manufacturer incorporation; it does not establish the ultimate operating sector of its customers or purchases in 2025.
([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/phenomexfkaberkeleylights_.pdf))

33. KAP Consulting - Automation and Controls Integration & Programming

· Taxonomy evidence: The business identifies itself as a system integrator and describes positioning-stage integration, customer-machine retrofits, and support for equipment builders. This supports a distinct integration role but does not demonstrate that it purchases complete stages or establish transaction volumes.
([kapconsultingllc.com](https://kapconsultingllc.com/automation.html))

34. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Taxonomy evidence: The March xx.xx 2024 procurement separately identifies stages with built-in controllers, a joystick, a power supply, and accessories, supporting distinction between stage-control packaging and ancillary equipment.
([tifr.res.in](https://www.tifr.res.in/maincampus/viewNoticeFile.php?f=VTNVU21UaFBybGJuRDJwakJmdXdVUT09&s=WFdXaTkwL1ZDTGdxaHp6eHA1bkh1QT09))

· Taxonomy evidence: The buyer explicitly requests motorized rotation and linear stages with built-in controllers and a vertical stage with an integrated controller.
([tifr.res.in](https://www.tifr.res.in/maincampus/viewNoticeFile.php?f=VTNVU21UaFBybGJuRDJwakJmdXdVUT09&s=WFdXaTkwL1ZDTGdxaHp6eHA1bkh1QT09))

· Taxonomy evidence: The procurement requests named stage model numbers, providing buyer-side evidence of purchasing predefined commercial stage offerings rather than commissioning an unspecified new design.
([tifr.res.in](https://www.tifr.res.in/maincampus/viewNoticeFile.php?f=VTNVU21UaFBybGJuRDJwakJmdXdVUT09&s=WFdXaTkwL1ZDTGdxaHp6eHA1bkh1QT09))

· Taxonomy evidence: The single-quote invitation is addressed directly to the stage manufacturer, establishing a solicited direct-manufacturer procurement relationship, not proof of a completed sale.
([tifr.res.in](https://www.tifr.res.in/maincampus/viewNoticeFile.php?f=VTNVU21UaFBybGJuRDJwakJmdXdVUT09&s=WFdXaTkwL1ZDTGdxaHp6eHA1bkh1QT09))

35. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1

- Taxonomy evidence: The September xx.xx 2023 RFQ requires a compatible controller and power supply with the high-precision linear stage. It establishes control-inclusive supply, but does not explicitly establish controller housing location.
([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))
- Taxonomy evidence: The stage RFQ expressly accepts responses from the original equipment manufacturer or its authorized Indian distributor, independently establishing the two contractual selling roles used in this axis.
([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))
- Taxonomy evidence: Original equipment manufacturers are explicitly eligible to supply the requested complete linear stage directly to the institutional purchaser.
([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))
- Taxonomy evidence: An authorized distributor is explicitly eligible to supply the same complete-stage procurement. This establishes a reseller route, not a channel share or awarded transaction.
([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))

36. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Taxonomy evidence: The manufacturer-authored paper distinguishes standard off-the-shelf, standard configured-to-order, and custom-engineered motion solutions. This supports commercial terminology, not a verified global allocation.
([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Taxonomy evidence: Preconfigured positioning stages illustrate the author's standard off-the-shelf offering format.
([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Taxonomy evidence: The paper identifies the manufacturer's PlanarDL XY stage as a standard configured-to-order product.
([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Taxonomy evidence: A custom-engineered goniometer illustrates a stage designed to meet unique customer requirements.
([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

37. Loan Service for Nanopositioners

- Taxonomy evidence: The manufacturer explicitly describes its EC*xx.xx positioner product line as intended for ambient conditions. The inspected page concerns loan kits; loan activity is not counted as new-stage market revenue.
([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

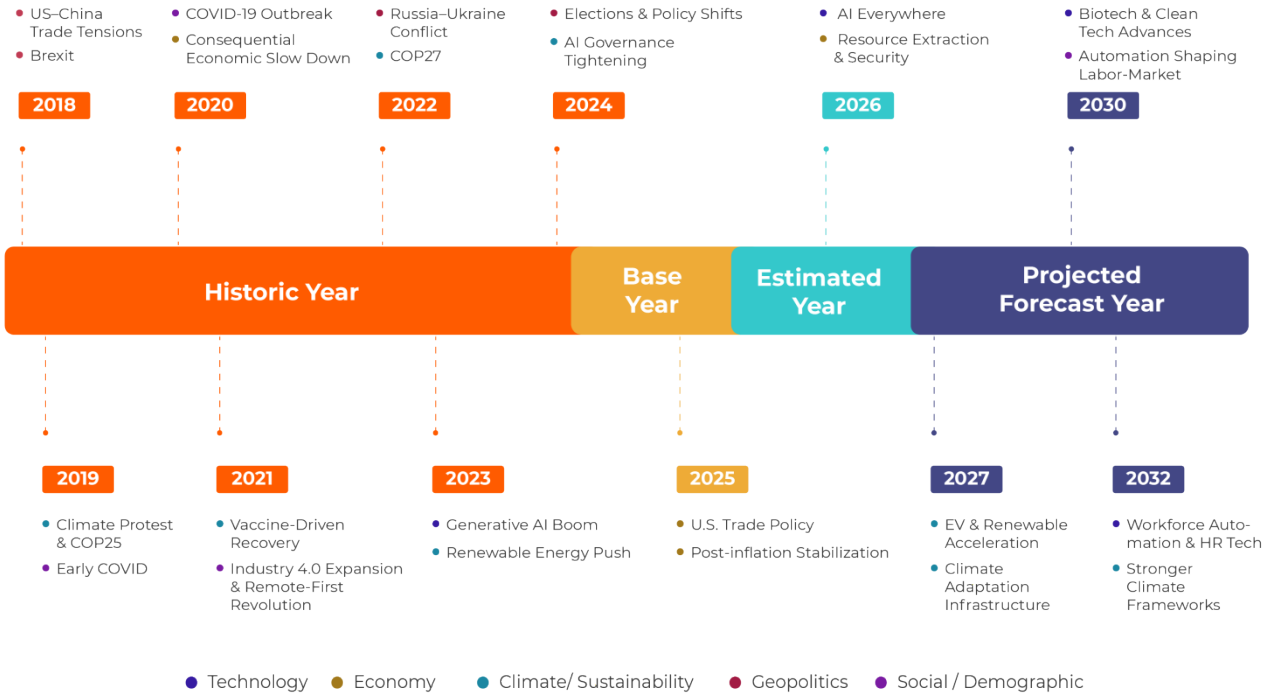
38. Positioning Stages and Systems - Motionlink Ltd

- Taxonomy evidence: Motionlink explicitly identifies positioning tables distributed by its business, providing an independently retrieved example of a stage-distribution operation outside the Indian procurement records.
([motionlink.co.uk](https://motionlink.co.uk/motionlink/positioning-stages-and-systems/))
- Taxonomy evidence: The company's marketed stage range distinguishes standard-environment offerings from demanding-environment options, including vacuum, cryogenic, radiation-tolerant, and nonmagnetic positioning. This is evidence of its own commercial offering, not global category shares or exclusive single-environment purchases.
([motionlink.co.uk](https://motionlink.co.uk/motionlink/positioning-stages-and-systems/))

1.4. Years Considered for the Study

The study designates 2024 as the historical year, 2025 as the base year, 2026 as the estimated year, and 2032 as the forecast endpoint. These period roles distinguish historical context, base-year interpretation, estimated conditions, and the forward-looking outlook through 2032.

Figure 1. Global Motion Positioning Stages Market, Years Considered for the Study



1.5. Currency Considered for the Study

Monetary reporting is in United States dollars (USD), expressed as absolute values.

1.6. Language Considered for the Study

The study is published in American English.

1.7. Key Stakeholders

- Stage manufacturers and stage-subsystem suppliers: portfolio positioning, configuration coverage, customization commitments, qualification evidence, and choices between direct and intermediary customer access.
- Equipment OEMs: stage selection for equipment integration, allocation of drive and control responsibilities, supplier qualification, substitution requirements, and continuity of product support.
- Independent System Integrators: compatibility and responsibility across stage, drive, control, and downstream equipment interfaces, including the contractual scope of integration and support.

- Direct Operators across the included end-user sectors: fit to the intended application and environment, procurement acceptance, maintainability, support obligations, and the consequences of changing suppliers.
- Distributors and resellers: authorized product and territory coverage, customer-support responsibilities, manufacturer coordination, and the limits of commitments made through the channel.
- Drive, guidance, feedback, and control-component suppliers: relationships with stage manufacturers and integrators, interface responsibilities, and differentiation between upstream component participation and supply of an in-scope stage.
- Investors and corporate strategy teams: offering-specific commercial participation, defensible competitive comparisons, customer-access conditions, and the prerequisites for partnership, acquisition, or entry decisions.

2. Research Methodology

2.1. Introduction

The Global Motion Positioning Stages study frames commercial decisions around stage offerings, their purchasers, and the responsibilities attached to supplying and integrating them. Its approach separates documented business facts from economic interpretation and keeps the accepted product hierarchy consistent across supplier, buyer, channel, and geographic analysis.

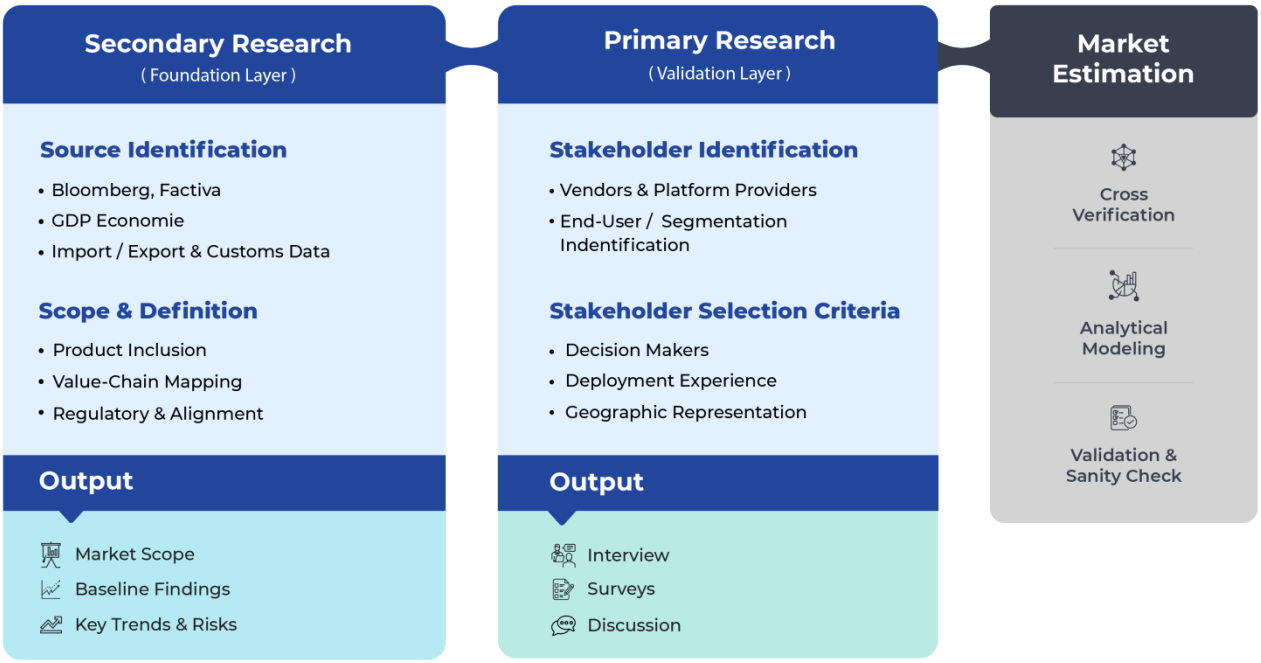
Analyst-led primary research provides a qualitative challenge layer alongside secondary evidence. Market explanations and subsequent quantitative interpretation must remain within the same stage-only boundary and distinguish historical observations, estimated conditions, and forward-looking assumptions.

2.2. Research Design

The design centers on identifiable stage offerings and the commercial relationships through which they reach Equipment OEMs, Independent System Integrators, and Direct Operators. An individual stage configuration, a product family, a supplier's broader business, and downstream equipment are distinct units of interpretation.

Evidence should establish only the fact within its authority: an advertised offering, a disclosed business relationship, a buyer requirement, or a jurisdiction-specific access condition. Commercial explanations then connect those facts to procurement, integration responsibility, substitution, and competitive choice without treating a proposed objective as a completed finding.

Figure 2. Global Motion Positioning Stages Market, Research Design



2.2.1. Primary Research

The analyst team conducted primary research as a qualitative challenge layer for market definition, segmentation, demand conditions, adoption barriers, and competitive interpretation. This work tested analytical assumptions and sharpened explanations of market mechanisms without serving as standalone support for numerical estimates.

The qualitative challenge layer is evaluated alongside secondary evidence within the accepted market scope. It informs conditional market explanations and hypotheses for subsequent quantitative analysis. Numerical estimates require their own supporting evidence, and a forecast derived from a qualitative assumption does not independently validate that assumption. Final interpretation must reconcile the qualitative findings with the completed quantitative results.

2.2.2. Secondary Research

Secondary commercial evidence has distinct roles. Official portfolios can establish how a supplier advertises its own stages and configurations; filings can establish disclosed business and ownership facts; buyer policies and public awards can establish particular purchasing requirements or relationships; and applicable official legal or regulatory records can establish jurisdiction-specific conditions.

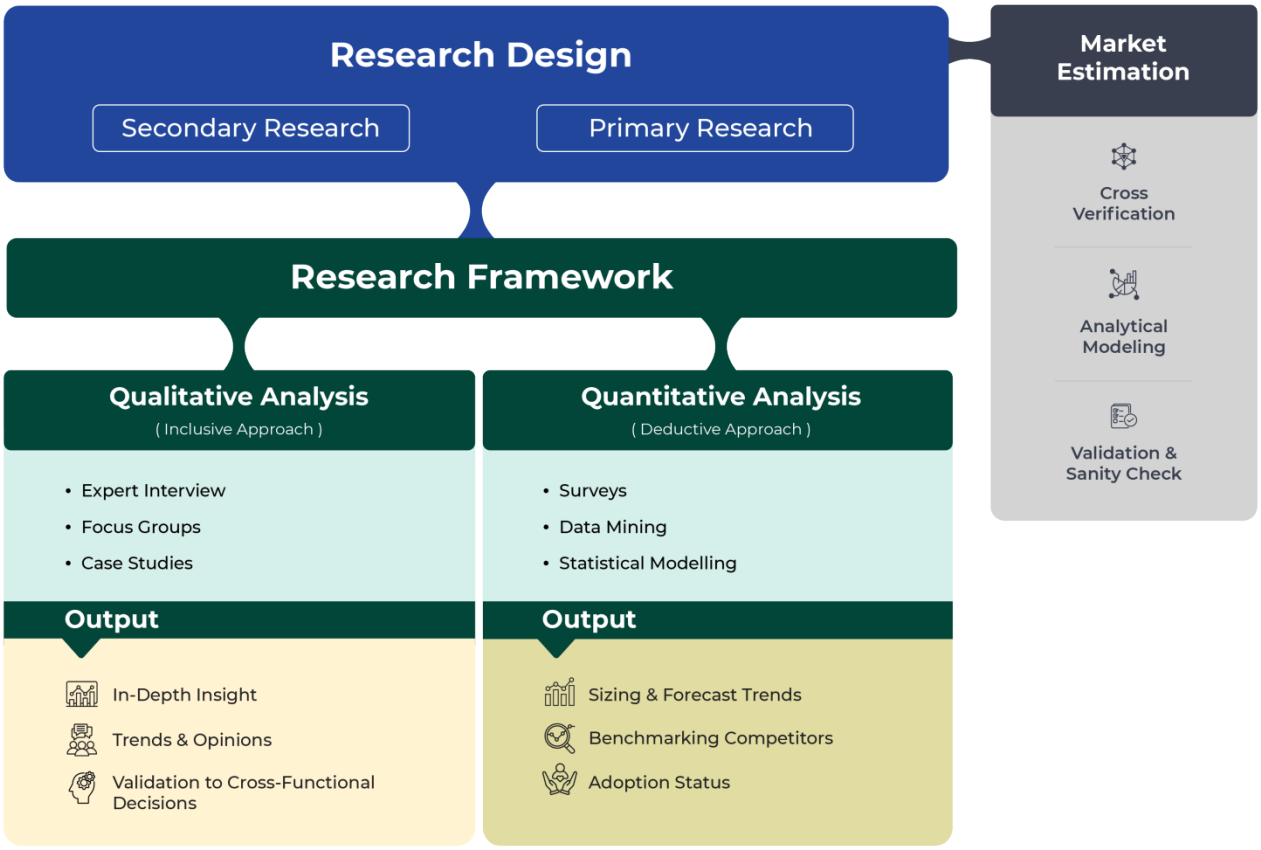
Each claim must retain the source's product coverage, effective period, business-entity boundary, and underlying authority. An announcement does not by itself establish delivery availability, a portfolio entry does not establish buyer acceptance, and a distributor relationship does not establish unrestricted rights across all territories. Independent support is required where the commercial conclusion exceeds what a single record establishes.

2.3. Research Framework

The framework links the accepted stage definition to its segmentation, then connects documented supplier participation with buyer requirements and commercial access. Offering identity comes before comparison: a stage assembly must not be confused with an upstream component, a controller sold independently, or the complete equipment incorporating it.

Competitive interpretation follows the responsibilities attached to the offering, including integration, customization, qualification, distribution, and support. Quantitative interpretation must retain the same boundaries rather than using broader company or end-use activity to bypass an unresolved stage-specific question.

Figure 3. Global Motion Positioning Stages Market, Research Framework



2.3.1. Qualitative Analysis

The qualitative framework addresses how purchasing decisions differ among Equipment OEMs, Independent System Integrators, and Direct Operators. Relevant questions include buyer qualification, switching requirements, responsibility for drives and controls, customization commitments, channel support, and the documentation supporting an operating-environment claim.

Comparison concerns the supplied stage and its commercial relationship, rather than the technology label alone. The qualitative challenge layer can test explanations of buyer behavior

and competitive differentiation, but it does not establish that every configuration is interchangeable or that a supplier's broader capabilities apply to a particular offering.

2.3.2. Quantitative Analysis

Quantitative interpretation is bounded by the Global Motion Positioning Stages definition, the designated study periods, and absolute monetary reporting in USD. Product, business-entity, geographic, and period boundaries must remain aligned when evidence is compared.

The segmentation axes describe different characteristics of the same in-scope activity. Configuration, actuation, drive, guidance, feedback, application, sector, purchasing role, control integration, customization, channel, and environment therefore cannot be added together as separate opportunities. Category breadth, expert participation, and the existence of a supplier offering do not independently establish economic weight.

2.4. Market Size Estimation

Market-value interpretation concerns economic activity attributable to in-scope Motion Positioning Stages, rather than the full equipment, instrument, or automation ecosystems in which stages are used. Included drive-ready and control-free offerings remain within the stage boundary, while upstream components and downstream equipment retain their separate commercial identities.

Numerical conclusions require supporting evidence that matches the relevant offering and study period. Qualitative interpretation can identify attribution questions and challenge assumptions, but it cannot supply an unsupported numerical allocation or establish the economic importance of an included category.

2.4.1. Top-Down Approach

The top-down analytical role is to check whether broader equipment, automation, and end-use context is compatible with the stage-only definition. Such context can identify demand questions and boundary inconsistencies, but it is not equivalent to activity attributable to Motion Positioning Stages.

No mechanical allocation from an adjacent industry is justified by category overlap alone. Any proposed relationship must preserve the distinction between the positioning stage, other equipment content, and the downstream activity that the equipment supports.

2.4.2. Bottom-Up Approach

The bottom-up analytical role is to connect economic evidence to identifiable in-scope stage offerings and supplier relationships. Catalog, configured-to-order, custom-engineered, and equipment-integrated stage offerings require a consistent stage-only boundary, even when their commercial descriptions differ.

Manufacturer supply, incorporated components, distributor resale, and the downstream machine must not become separate additive descriptions of the same stage activity. A

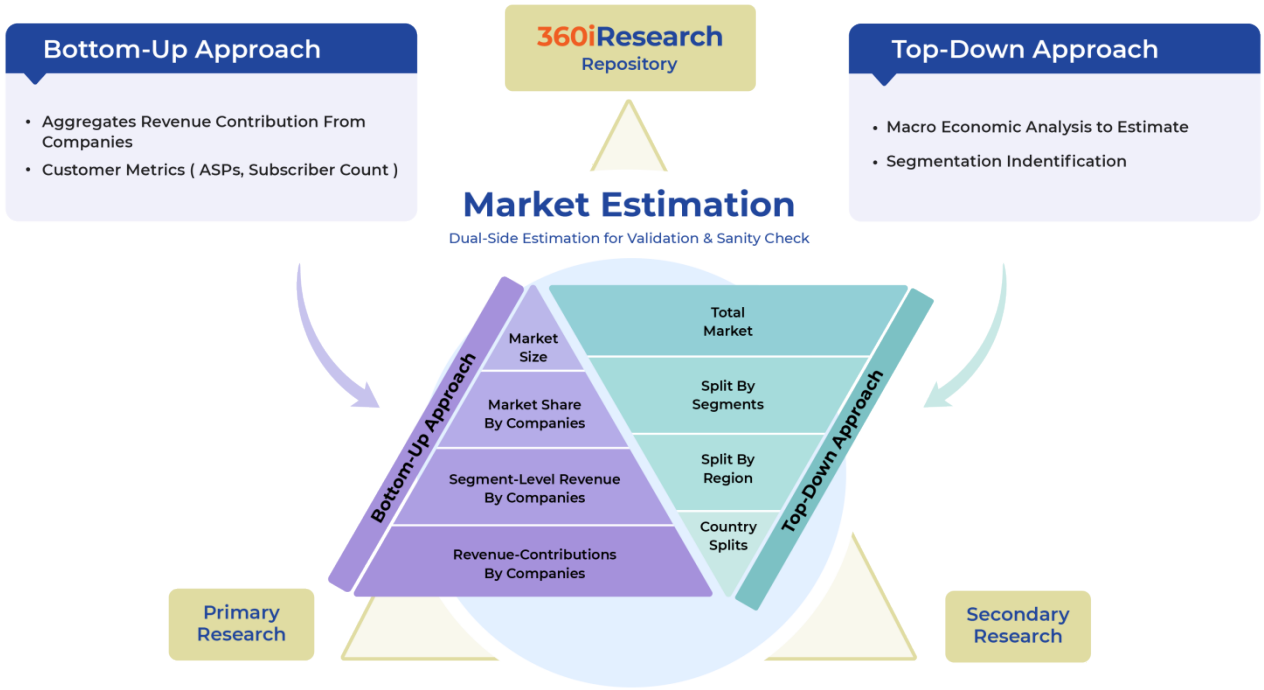
supplier's wider automation or instrumentation portfolio cannot substitute for evidence attributable to its stage business.

2.5. Data Triangulation

For Motion Positioning Stages, triangulation concerns whether different evidence refers to the same offering, supplied configuration, commercial relationship, geography, and period. Agreement in terminology is insufficient when one description includes controls or customization obligations and another does not.

Offering descriptions, business disclosures, buyer requirements, and qualitative interpretation serve different evidentiary purposes. Conflicts in availability, qualification, or responsibility should remain explicit until resolved; they should not be averaged away or settled by repetition of claims with the same underlying origin. Qualitative findings challenge interpretation rather than independently settling numerical conclusions.

Figure 4. Global Motion Positioning Stages Market, Data Triangulation



2.6. Research Outcomes

The study is intended to support defensible comparisons of stage offerings, supplier participation, purchasing requirements, and routes to customers. Its decision outputs concern which offerings address a buyer's positioning requirement, what qualification and integration responsibilities accompany them, and which commercial conditions must be verified before procurement, supplier substitution, partnership, or market entry.

Strategic interpretation should distinguish an included category from demonstrated demand, an advertised capability from an applicable commercial commitment, and an attractive

application from accessible business. Conclusions remain conditional where product-specific availability, contractual rights, buyer acceptance, or delivery obligations are not established.

2.7. Research Assumptions

- Different segmentation axes describe the same underlying stage activity. Cross-axis combinations support comparison, but must not be treated as additive opportunities.
- A stage comparison applies to the documented configuration and scope of supply, not automatically to every variant in a product family. Procurement decisions require confirmation of the selected offering.
- Purchasing Role and End-User Sector remain distinct. An Equipment OEM or Independent System Integrator does not by itself identify the sector of the eventual operator, so demand interpretation must preserve that distinction.
- An operating-environment classification applies to the documented qualification scope of the offering. It does not establish suitability for an unstated environment or combination of conditions.
- Comparisons of catalog, configured, and custom-engineered stages require explicit treatment of integration, control, support, and contractual responsibilities. Apparent product similarity does not establish equivalent supplier obligations or switching requirements.

2.8. Research Limitations

- A broader corporate disclosure cannot establish a stage-specific conclusion unless its product and business boundaries are separable. Where that distinction is unresolved, the wider company's activity must not be attributed to Motion Positioning Stages.
- Advertised configurations do not alone establish local commercial availability, buyer acceptance, or enforceable service obligations. Supplier-selection conclusions remain conditional on the applicable offering, territory, and commercial agreement.
- Feedback, guidance, actuation, and control labels do not independently establish equivalent delivered performance or substitutability. Comparisons require the buyer's requirement and the documented scope of the complete stage offering.
- Where a custom or embedded stage is documented only within a larger equipment arrangement, standalone product comparisons and responsibility allocation remain conditional until the stage's commercial boundary is established.
- Inclusion of an application, sector, or operating-environment category establishes study coverage, not demonstrated adoption or accessible demand. Opportunity conclusions require separate commercial evidence for the relevant buyer and offering.

3. Executive Summary

3.1. Introduction

The Global Motion Positioning Stages market is differentiated by the assembly and responsibility a buyer can accept rather than by a single preferred architecture. Manual, drive-ready and controlled stages remain distinct purchasing propositions across catalog, configured and custom supply. Zaber's ASR family illustrates alternative motor-only and built-in-controller packages; ETEL's Full Forward Integration extends the possible contract to selected surrounding system elements. These offerings address different amounts of OEM-retained work and are not automatically interchangeable.

The decisive choice for Equipment OEMs, Independent System Integrators and Direct Operators is the narrowest delivery scope that meets the requirement, with controls, application acceptance and continuing support assigned explicitly. Broader integration can consolidate coordination, but a product description alone does not establish complete-equipment responsibility or an executable order.

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   · The ASR family distinguishes motor-only and built-in-controller series, supporting comparison of different supplied control packages rather than automatic interchangeability.
   ([zaber.com](https://www.zaber.com/products/families/ASR))
2. Full forward integration - ETEL SA
   · ETEL's Full Forward Integration can comprise part or all of listed positioning platforms, frames, isolation and electronics, establishing a broader but variable delivery boundary.
   ([etel.ch](https://www.etel.ch/motion-systems/full-forward-integration/))

3.2. CXO Perspective

Supplier executives should link dedicated engineering commitments to approved equipment programs and funded milestones rather than application interest alone. HOERBIGER attributes part of PI's below-expectation 2025 performance to weak automation demand and reduced publicly funded U.S. projects. This company-specific experience supports selective account investment, not a uniform market conclusion; earlier engagement retains influence but increases exposure to deferral or cancellation.

Equipment OEMs should distinguish supplied-part conformity from finished-instrument acceptance: New Scale Technologies' terms use its written part-number specifications unless different requirements are agreed in writing and exclude fitness-for-purpose warranties. Direct Operators also have a retain-versus-replace choice through Aerotech's published repair route and Zaber's X-NA micrometer-replacement accessory. Retention can preserve interfaces but also preserve limitations. Any broader acceptance, repair and replacement-support obligations should be settled before commitment.

Sources & Evidence

1. X-NA Micro, Motorized Linear Actuators, Built-in Controllers - Zaber
   · Zaber markets X-NA actuators as replacements for standard micrometer heads on manual translation stages, establishing an accessory-led retention route rather than another complete-stage offering. ([zaber.com](https://www.zaber.com/products/linear-actuators/X-NA))
2. New Scale Technologies, Inc. - Terms and Conditions, Revision 05.06.2025
   · New Scale's terms default to written specifications for its assigned part number unless different specifications are agreed in writing, and exclude fitness-for-purpose warranties. These provisions distinguish supplied-part conformity from broader instrument acceptance. ([newscaletech.com](https://newscaletech.com/wp-content/uploads/NewScale-Terms-Conditions_2025.pdf))
3. Positioning 2026 Business Report - HOERBIGER
   · HOERBIGER attributes PI's below-expectation 2025 performance partly to weak automation demand and reduced publicly funded U.S. projects, while also identifying favorable ACS activity. The observations are company-specific. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
4. Warranty and Service Policy - Aerotech
   · Aerotech's published policy provides authorized repair routes and makes expedited and field service conditional. It supports evaluating retention without assuming an uninterrupted or unrestricted service outcome. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/aerotech-warranty-policy.pdf))

3.3. New Revenue Opportunities

Conditional revenue routes include embedded modules for Equipment OEMs, instrument-compatible microscopy packages through appointed channels, environment-matched catalog variants for research buyers, and institutional supply with installation and continuing support. New Scale Technologies' M3-LS, Zaber's ASR family and AVR Optics appointment, PI's vacuum-ready variants, and IISc's historical purchasing requirements illustrate these themes. Capture depends on an approved need, accepted configuration, eligible contracting route and defined support; historical solicitations establish neither open opportunities nor awards. The Opportunity Mapping section provides the detailed assessment of these buyer-specific routes.

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   · ASR advertises microscopy software and mounting support with series-specific features, supporting a configuration-dependent microscopy proposition. ([zaber.com](https://www.zaber.com/products/families/ASR))
2. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA
   · PI distinguishes vacuum-ready standard products for selected series from modifications available on request, supporting a configuration-specific environmental supply proposition. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
3. Locations and Contact - Zaber
   · Zaber lists AVR Optics for microscopy products and support in Canada, Mexico and the United States, establishing a geographically bounded appointment. ([zaber.com](https://www.zaber.com/contact/))

4. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
   · IISc's September xx.xx 2023 stage solicitation required installation, institutional acceptance and continuing support. It establishes historical purchasing requirements, not an open opportunity or award. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))
5. Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System
   · IISc's June xx.xx 2025 RFQ imposed domestic-supplier conditions and did not accept local installation or related services as sufficient local value addition for imported products. These were solicitation-specific eligibility conditions. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))
6. Linear Micro Stages - New Scale Technologies
   · M3-LS embeds controller and drive electronics in the stage housing and is advertised for OEM incorporation, establishing an identifiable module proposition rather than customer approval. ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))

3.4. Next-Generation Business Models

The assessed business-model options change the responsibility sold with a stage: a bounded module such as M3-LS, or a negotiated integration package such as ETEL's Full Forward Integration. These are documented offering formats, not an established market-wide shift to complete-machine responsibility. Suppliers should distinguish assembly delivery, commissioned engineering and continuing support in the agreement. Consolidation can reduce separately managed supplier interfaces, while narrower supply preserves component choice and leaves coordination with the buyer.

Independent integration services and appointed distribution provide different routes to the customer. KAP Consulting advertises positioning-stage integration and retrofits without establishing stage-purchase authority. Zaber's territorial and selected-product appointments likewise constrain channel scope. An arrangement must identify who orders the stage, contracts the integration work and owns escalation. Separate operator purchasing and integration-service agreements remain an option where the integrator lacks a purchasing mandate; direct manufacturer access is an alternative only where offered.

Sources & Evidence

1. Locations and Contact - Zaber
   · Zaber documents territorial exclusivity, selected-product appointments and regions offering direct support alongside local channels; these distinctions constrain route selection without establishing order-specific service allocation. ([zaber.com](https://www.zaber.com/contact/))
2. KAP Consulting - Automation and Controls Integration & Programming
   · KAP Consulting advertises positioning-stage integration, machinery retrofits and assistance to equipment builders. Its service description does not establish project-specific stage purchasing or reseller authority. ([kapconsultingllc.com](https://kapconsultingllc.com/automation.html))
3. Full forward integration - ETEL SA
   · ETEL offers an integrated procurement route combining motion and selected surrounding system elements; the selected scope remains distinct from a uniform complete-machine commitment. ([etel.ch](https://www.etel.ch/motion-systems/full-forward-integration/))
4. Linear Micro Stages - New Scale Technologies
   · M3-LS consolidates stage and control selection within a bounded module, supporting comparison with separately procured or broader integration packages. ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))

5. Single Axis Stages | HIWIN
   · HIWIN advertises SDXK compatibility with its own and third-party servo and stepper motors, establishing a narrower sourcing alternative. ([hiwin.com](https://hiwin.com/products/single-axis-stages/))

3.5. Industry Roadmap

For 2026-2027, EU suppliers and integrators face a defined commercial milestone: the Machinery Regulation becomes mandatory on January xx.xx 2027 for covered products. Classification, placement timing and documentation responsibility should be agreed before accepting affected delivery obligations. The transition does not establish a replacement requirement for installed stages or identical treatment of every included category; unsettled classification warrants deferring the affected commitment.

For 2028-2029 sourcing decisions, monitor whether announced investment becomes an accepted delivery route. MISUMI's January xx.xx 2026 announcement describes planned positioning-stage production expansion in China and Vietnam, not confirmation of completion or a buyer-specific supply commitment. A named configuration, identified manufacturing and selling entities, procurement eligibility and agreed delivery are the relevant triggers. Retaining an established route is preferable where a proposed alternative has not resolved the actual supply or responsibility gap.

For 2030-2032 planning, long-lived equipment programs should secure replacement configurations, documentation access and support ownership rather than assume convergence on one control package. HIWIN's third-party-motor offering supports retaining alternative purchasing boundaries, subject to accepted interfaces and future supplier commitments. Separately, PI explicitly describes its presented magnetic-levitation platforms as technology demonstrators. Their offering-specific delivery, acceptance and continuing support remain unresolved; commercial agreement, not a presumed launch date, is the milestone for treating these examples as purchasing alternatives.

Sources & Evidence

1. Machinery - European Commission
   · The European Commission states that the Machinery Regulation applies mandatorily from January xx.xx 2027 and distinguishes the preceding Machinery Directive regime. Application concerns covered products rather than every stage category automatically. ([single-market-economy.ec.europa.eu](https://single-market-economy.ec.europa.eu/sectors/mechanical-engineering/machinery_en))
2. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
   · PI explicitly labels its presented magnetic-levitation platforms as technology demonstrators and offers application discussions. That status does not establish standardized delivery, application acceptance or continuing-support commitments. ([pi-usa.us](https://www.pi-usa.us/en/tech-blog/picopositioning-maglev-6dof-linear-rotary-stages))
3. MISUMI Expands Automated Positioning Stage Production for Data Centers
   · MISUMI's January xx.xx 2026 announcement describes planned automated-positioning-stage production investment in China and Vietnam. The announcement does not establish completion or an individual buyer's accepted delivery commitment. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
4. Single Axis Stages | HIWIN
   · The documented third-party-motor alternative supports preserving distinct purchasing boundaries, but does not establish future replacement commitments. ([hiwin.com](https://hiwin.com/products/single-axis-stages/))

4. Market Overview

4.1. Introduction

The Global Motion Positioning Stages market combines standardized assemblies with configured and custom-engineered supply. ■■■■■■■■ ■■■■■■■■■ ■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■■■■ These examples illustrate different supplied packages, not equivalent products or relative supplier standing.

■■■ ■■■■■■■■■■ ■■■■■■■■ ■■ ■■■ ■■■■■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ Equipment OEMs, Independent System Integrators, and Direct Operators can purchase different portions of the integration package. Upstream components and complete downstream machines provide context but are not interchangeable with the stage being procured.

Figure 5. Global Motion Positioning Stages Market Size, 2017-2040 (USD Million, Growth %)

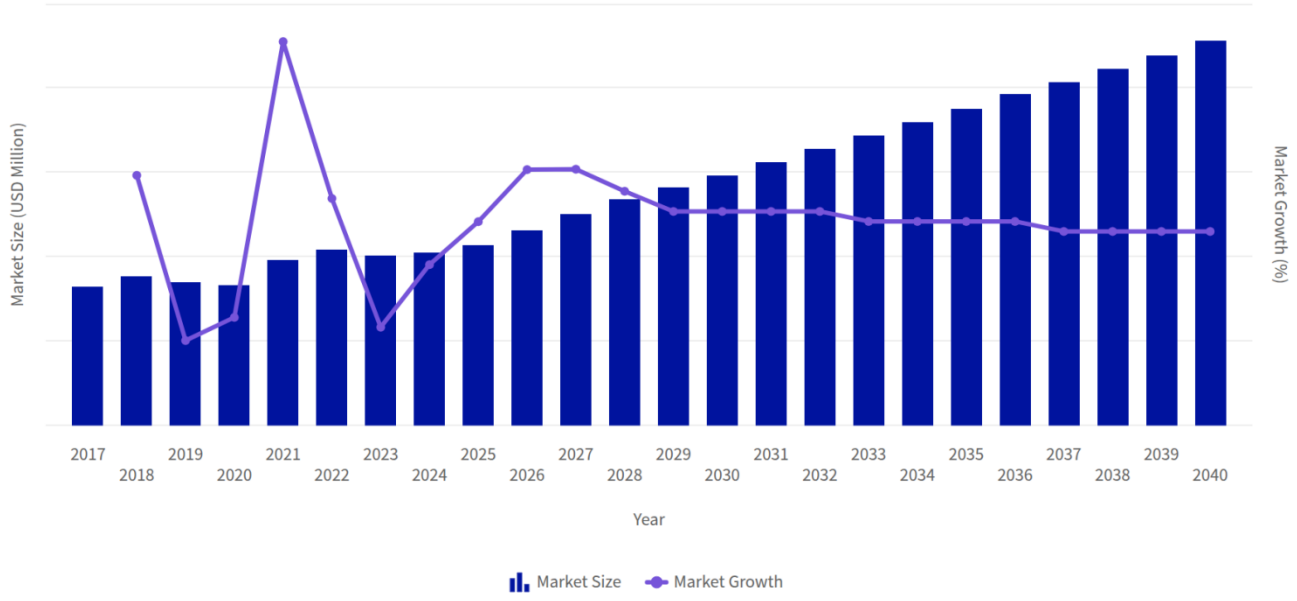


Table 2. Global Motion Positioning Stages Market Size, 2017-2040 (USD Million, Growth %)

Metric	2017	2024	2025	2026	2027	2032	2040
Market Size (USD Million)	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Market Growth (%)	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Sources & Evidence

1. Custom Stages & Actuators | Aerotech
   - Aerotech publishes custom stages and actuators as an offering alongside catalog-based technologies. ([aerotech.com](https://www.aerotech.com/product/custom-stages-actuators/))

2. X-LDQ-AE Features - Zaber
   · X-LDQ-AE is described as a linear-stage series with built-in controllers and linear encoders. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE/features))
3. X-RST-AE Features - Zaber
   · X-RST-AE is described as a motorized rotary-stage series with built-in controllers and direct encoders. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/features))
4. Positioning 2026 Business Report - HOERBIGER
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
5. MKS Inc. Annual Report 2025
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
6. SIGMAKOKI Integrated Report 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
7. MISUMI Integrated Report 2025 - Business Portfolio
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
8. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
9. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
10. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
11. Aerotech Recruiting FAQs
    · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.

12. Novanta Announces Agreement to Acquire Motion Solutions
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

13. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
- Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

14. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.

15. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

16. World Robotics 2025 Industrial Robots - Executive Summary
- Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
- Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
- Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
- Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.

17. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
- Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

18. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
- Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.

19. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
- Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

20. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
- Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.

21. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
· Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
· Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
22. MISUMI Expands Automated Positioning Stage Production for Data Centers
· Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
23. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
· Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

4.2. Key Growth Contribution

OEM incorporation can translate a larger equipment program into a stage purchase. Dover Motion reports Cellerate selecting SmartStage XY with onboard controls, illustrating adoption through a bounded motion subsystem rather than independently sourced mechanics and electronics. Serving that need requires agreed interfaces and an accepted division of equipment responsibility. The mechanism is conditional: packaged controls are useful only where they fit the buyer's retained architecture, and a named incorporation example establishes neither continuing orders nor universal preference for integration.

Figure 6. Global Motion Positioning Stages Market, Key Growth Contribution, by Region, 2025-2032 (USD Million)



Figure 7. Global Motion Positioning Stages Market, Key Growth Contribution, by Country, 2025-2032 (CAGR %)

Table 3. Global Motion Positioning Stages Market, Key Growth Contribution, 2025-2032

Scope	Leading Category	Added Market Size (USD Million)	Growth Share (%)	CAGR (%)
Actuation Mode	xx.xx	xx.xx	xx.xx	xx.xx
Application	xx.xx	xx.xx	xx.xx	xx.xx
Control Integration	xx.xx	xx.xx	xx.xx	xx.xx
Country	xx.xx	xx.xx	xx.xx	xx.xx
Customization Level	xx.xx	xx.xx	xx.xx	xx.xx
Drive Mechanism	xx.xx	xx.xx	xx.xx	xx.xx
End-User Sector	xx.xx	xx.xx	xx.xx	xx.xx
Feedback Architecture	xx.xx	xx.xx	xx.xx	xx.xx
Guidance Technology	xx.xx	xx.xx	xx.xx	xx.xx
Operating Environment	xx.xx	xx.xx	xx.xx	xx.xx
Purchasing Role	xx.xx	xx.xx	xx.xx	xx.xx
Region	xx.xx	xx.xx	xx.xx	xx.xx
Sales Channel	xx.xx	xx.xx	xx.xx	xx.xx
Stage Configuration	xx.xx	xx.xx	xx.xx	xx.xx

Sources & Evidence

1. Automating Precision Assembly with the SmartStage XY

- Dover Motion reports Cellerate's selection of SmartStage XY and describes onboard controls as reducing separately accommodated electronics; this is a supplier-reported incorporation example, not evidence of continuing orders. ([dovermotion.com](https://dovermotion.com/case-studies/automating-precision-assembly-with-the-smartstage-xy/))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

2. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased from EUR xx.xx to EUR xx.xx; this counterforce tempers the modeled custom-stage growth assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Sales increased from EUR xx.xx to EUR xx.xx; this counterforce tempers the modeled custom-stage growth assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx

3. MKS Inc. Annual Report 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.

5. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

6. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
7. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The

13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

14. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
15. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
16. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
17. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

18. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies approximately JPY xx.xx investment and planned doubling of automated-stage supply capacity; it supports a conditional adoption premise, not realized revenue.

19. Locations and Contact - Zaber

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

20. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

21. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
22. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
23. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

24. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
25. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

26. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
27. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
28. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
29. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

30. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
31. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
32. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
33. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
34. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
35. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
36. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
37. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

38. Increased Production of Automated Stages for Data Centers and Components for Growth Industries - MISUMI, July 31, 2026

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

59. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

60. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

61. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase.
([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase.
([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights.
([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights.
([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

62. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue.
([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

63. P-737 PIFOC Specimen Z Positioners - PI

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

64. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.

65. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.

66. ZEISS concludes fiscal year 2024/25 with solid growth
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.

67. TRUMPF Annual Report 2024/25
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

68. Dimensional nano and sub nanometrology - National Physical Laboratory
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.

69. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.

70. Facility Equipment - MIRIAM/B22 - Diamond Light Source
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.

71. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
72. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
73. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

74. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
75. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
76. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.

77. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
78. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
79. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.

83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
87. Simplified Motion Series - Festo USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
91. Meeting the Demands of the Most Critical OEMs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.

95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.

96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

4.3. Industry Ecosystem & Value Chain Analysis

Value capture depends on the responsibility supplied with the assembly. ▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ Equipment OEMs and Independent System Integrators should compare the defined deliverables and acceptance boundary, rather than stage descriptions alone.

▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ Hardware ownership therefore should not be confused with unrestricted redesign rights or a guaranteed service outcome. Consolidated supply may

simplify escalation, but the buyer should establish the applicable agreement, change permissions, and service owner before relying on that benefit.

Sources & Evidence

1. Custom Stages & Actuators | Aerotech
   · Custom stage supply addresses requirements not fully met by standard catalog products; complete-machine accountability is not established. ([aerotech.com](https://www.aerotech.com/product/custom-stages-actuators/))
2. Global Technical Support | Aerotech
   · Aerotech advertises repair services and remote and on-site support, establishing a continuing-support offering. ([aerotech.com](https://www.aerotech.com/services/global-technical-support/))
3. X-LDQ-AE Features - Zaber
   · The controller is included in the described stage package, supporting a distinct delivery boundary. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE/features))
4. Terms & Conditions of Sale
   · Published terms restrict copying and modification, supporting separation of hardware possession from unrestricted change rights. ([newport.com.cn](https://www.newport.com.cn/terms-and-conditions-of-sale))

4.3.1. Supply-Side Analysis

[redacted] That relationship supports a potential stage-and-control procurement route, but does not establish that every PI stage includes ACS controls or that an independent control arrangement is unavailable. Buyers should distinguish group capability from the quoted offering.

Upstream participation is also relationship-gated. PI's published onboarding requires supplier assessment, document review, and an initial order and quality check before supplier-pool admission. [redacted]

Sources & Evidence

1. About PI US: Custom Design & Service / Export Controlled Applications & ITAR Registered
   · PI states that it acquired majority shares of ACS Motion Control in January 2017. ([pi-usa.us](https://www.pi-usa.us/en/about-pi))
2. Purchasing & Suppliers
   · PI describes assessment, review, and an initial order and quality check before supplier-pool admission. ([pi-usa.us](https://www.pi-usa.us/en/about-pi/becoming-a-supplier))

4.3.2. Demand-Side Analysis

Purchasing Role changes the integration problem being purchased. Zaber's ASR family includes built-in-controller and motor-only alternatives alongside microscopy software support. [redacted]

[redacted]

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   · ASR includes built-in-controller and motor-only models, Nucleus modules, µManager support, and microscope mounting options. ([zaber.com](https://www.zaber.com/products/families/ASR))

4.3.3. Stakeholder Analysis

The operator, contracting buyer, stage manufacturer, and channel intermediary can carry different risks. [redacted] A reseller's purchasing convenience does not itself establish manufacturer-backed service obligations.

Regulatory responsibility adds a separate division of duties. [redacted] Application or sector membership alone does not establish regulatory acceptance.

Sources & Evidence

1. Global Technical Support | Aerotech
   · The published support offer includes repairs and remote and on-site assistance, rather than a buyer-specific service agreement. ([aerotech.com](https://www.aerotech.com/services/global-technical-support/))
2. Terms & Conditions of Sale
   · The published warranty provisions exclude on-site warranty repair unless otherwise agreed; applicability depends on the accepted agreement. ([newport.com.cn](https://www.newport.com.cn/terms-and-conditions-of-sale))
3. Regulation (EU) 2023/1230 - Consolidated Text, May 29, 2026
   · The regulation distinguishes machinery and partly completed machinery and assigns economic-operator obligations for covered products. ([eur-lex.europa.eu](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX%3A02023R1230-xx.xx))

4.4. Market Dynamics

Integration convenience and asset retention act in opposite directions. A packaged-control stage can simplify a new purchase, while a compatible actuator upgrade or repair can preserve the installed assembly instead. [redacted]

Sources & Evidence

1. Global Technical Support | Aerotech
   · Repair is a documented alternative relevant to the conditional distinction between retention and replacement. ([aerotech.com](https://www.aerotech.com/services/global-technical-support/))
2. X-LDQ-AE Features - Zaber
   · The integrated package supplies the premise for contrasting new-package procurement with asset retention. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE/features))
3. X-NA Micro, Motorized Linear Actuators, Built-in Controllers - Zaber
   · Micrometer-head replacement is a documented accessory route; adequacy for a particular retained assembly is unverified. ([zaber.com](https://www.zaber.com/products/linear-actuators/X-NA))

4.4.1. Key Drivers

4.4.1.1. Software-supported microscopy creates configuration-specific purchase triggers

Zaber's ASR microscope-stage family advertises Nucleus modules, µManager support, and microscope mounting options. Such compatibility can create a purchase trigger when an operator needs automated positioning within an existing imaging platform. ■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■ ■■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■■

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   · Advertised ASR software and mounting support provides a product-specific premise for conditional microscopy purchasing incentives. ([zaber.com](https://www.zaber.com/products/families/ASR))

4.4.1.2. Packaged control can simplify the purchasing interface

Zaber's X-LDQ-AE stages include controllers and linear encoders. ■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■ ■■■ ■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■ The benefit is conditional: Equipment OEMs retaining their own control platform may prefer a less integrated offering rather than duplicate existing responsibilities.

Sources & Evidence

1. X-LDQ-AE Features - Zaber
   · Included controllers and encoders support the conditional inference of fewer separately procured interfaces. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE/features))

4.4.1.3. Environmental requirements create variant-specific demand

PI publishes standard vacuum-compatible stages and request-based modifications. ■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■ ■ ■■■■■■■■ ■■■■■■■ Access remains conditional on the selected configuration's documented coverage; an environmental label alone does not establish buyer acceptance or suitability for combined conditions.

Sources & Evidence

1. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA
   · PI publishes standard vacuum-compatible products and modifications available on request, establishing different commercial offering routes. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

4.4.2. Key Restraints

4.4.2.1. Installed integration requirements restrict practical switching

Zaber's RSM-E documentation supports third-party controller use but requires configuration-specific compatibility review. Switching is therefore neither frictionless nor universally blocked. ■■■■■ ■ ■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■ ■■ ■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■■■

Sources & Evidence

1. RSM-E Series User's Manual
   · RSM-E documentation contemplates third-party controllers and calls for compatibility review; it does not establish universal lock-in. ([zaber.com](https://www.zaber.com/manuals/RSM-E))

4.4.2.2. Equipment-program timing separates interest from commitment

MKS's 2024 filing describes cyclical end markets and lengthy prospective-customer qualification across its broader business. These disclosures caution against treating OEM interest as a purchase commitment, but do not establish stage-specific approval durations. ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■ ■■■■■■■■■

Sources & Evidence

1. Form 10-K for MKS Instruments Inc. for the Year Ended December 31, 2024
   · The 2024 filing describes cyclical markets and lengthy prospective-customer qualification across MKS's broader business, not stages alone. ([investor.mks.com](https://investor.mks.com/static-files/a8a62959-dcbb-4d70-8db7-dafdd9784afe))

4.4.2.3. Repair and accessory upgrades compete with stage replacement

■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■ ■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■ These routes can preserve an existing stage and defer replacement where it remains suitable. The actuator is an upstream accessory, not an additional stage offering; buyer-specific adequacy remains a separate decision.

Sources & Evidence

1. Global Technical Support | Aerotech
   · Aerotech offers repair services for its products, supporting repair as a possible retention route. ([aerotech.com](https://www.aerotech.com/services/global-technical-support/))
2. X-NA Micro, Motorized Linear Actuators, Built-in Controllers - Zaber
   · X-NA actuators are marketed as replacements for standard micrometer heads on manual translation stages. ([zaber.com](https://www.zaber.com/products/linear-actuators/X-NA))

4.4.3. Key Opportunities

4.4.3.1. Bounded motion modules for OEM incorporation

Equipment OEMs can purchase a defined stage-and-control module rather than coordinate those elements separately. New Scale Technologies' M3-LS establishes this offering route. ■■■ ■■■■■■■■■■■ ■■■■■■■ ■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■■■

Sources & Evidence

1. Linear Micro Stages - New Scale Technologies
   · New Scale advertises M3-LS stages with embedded controller and drive electronics, establishing a bounded stage-and-control offering. ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))

4.4.3.2. Environment-matched catalog and modification routes

Specialized buyers can compare an existing environmental variant with a requested modification before commissioning new scope. ■■ ■■■■■■■■■ ■■■■ ■■■■■■■ Capture depends on coverage of the selected requirement and an accountable supply commitment, not on an environmental label alone.

Sources & Evidence

1. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA
   · PI distinguishes selected vacuum-ready standard products from modifications offered on request. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

4.4.3.3. Institutional delivery with continuing support

■■■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■ ■■■ ■■■■■■ ■■ ■■■■■■ ■■■■■■■■■ ■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■ Suppliers able to contract those obligations can address a broader need than assembly delivery, provided they satisfy the actual procurement's eligibility conditions.

Sources & Evidence

1. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
   · IISc's September 2023 stage solicitation required continuing spares support and linked supply to satisfactory installation and institutional acceptance. It is a historical solicitation, not an award. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))

4.4.4. Key Challenges

4.4.4.1. Comparable quotations require a common delivery boundary

Aerotech's custom-stage offering and Zaber's packaged-control products allocate different work to the supplier. ■■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■ ■■ ■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■ A more integrated description does not by itself establish complete-machine accountability or buyer acceptance.

Sources & Evidence

1. Custom Stages & Actuators | Aerotech
   · The custom-stage offering supports distinguishing negotiated engineering scope from a standard package. ([aerotech.com](https://www.aerotech.com/product/custom-stages-actuators/))
2. X-LDQ-AE Features - Zaber
   · The packaged-control offering supports comparison of included responsibilities, not complete-machine accountability. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE/features))

4.4.4.2. Channel access does not establish service accountability

[redacted] Support availability and an enforceable service obligation are different propositions. For Distributor and Reseller Sales, buyers must establish appointment scope, escalation authority, and the responsible contracting party rather than presume equivalence to Direct Manufacturer Sales.

Sources & Evidence

1. Global Technical Support | Aerotech
   · Advertised support assistance does not itself establish a particular channel's enforceable service obligations. ([aerotech.com](https://www.aerotech.com/services/global-technical-support/))
2. Terms & Conditions of Sale
   · The on-site warranty provision supports verifying contractual coverage rather than assuming channel service equivalence. ([newport.com.cn](https://www.newport.com.cn/terms-and-conditions-of-sale))

4.4.4.3. Environmental coverage must remain aligned with the selected configuration

[redacted] Buyers of Single-Environment Qualified Stages and Combined-Environment Qualified Stages need written coverage for the selected configuration. Vacuum compatibility alone does not establish combined-environment acceptance; the execution challenge is keeping the quotation, allowed changes, and buyer acceptance scope aligned.

Sources & Evidence

1. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA
   · Standard vacuum offerings and requested modifications support configuration-specific coverage; combined-environment buyer acceptance is not established. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

4.5. Porter’s Five Forces Analysis

[redacted] A new entrant can compete for a defined assembly requirement, but an existing catalog does not establish equivalence to an engineered package. Buyer bargaining is stronger when acceptance requirements permit alternative configurations and weaker when the purchase preserves a particular integration arrangement.

Supplier power is similarly configuration-specific. ■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■ ■■■■■■ ■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ Upstream access also depends on the stage manufacturer's purchasing requirements, rather than technical category membership alone.

■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■ ■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■ Manual Stages themselves remain within the studied market; the external competitive alternative is the accessory-led retention decision. Its attractiveness depends on whether the retained assembly meets the buyer's requirement and support expectations.

Sources & Evidence

1. Custom Stages & Actuators | Aerotech
   · Custom-stage supply is a documented competitive route, not proof of equivalence to another supplier's package. ([aerotech.com](https://www.aerotech.com/product/custom-stages-actuators/))
2. About PI US: Custom Design & Service / Export Controlled Applications & ITAR Registered
   · The documented ownership relationship establishes affiliated control capability, not mandatory controller inclusion in every stage. ([pi-usa.us](https://www.pi-usa.us/en/about-pi))
3. Purchasing & Suppliers
   · Supplier-pool entry depends on PI's purchasing process rather than component category membership alone. ([pi-usa.us](https://www.pi-usa.us/en/about-pi/becoming-a-supplier))
4. X-LDQ-AE Features - Zaber
   · Integrated control is an observed supply model relevant to configuration-specific rivalry. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE/features))
5. X-NA Micro, Motorized Linear Actuators, Built-in Controllers - Zaber
   · The accessory offering supports retention as a conditional alternative to another stage purchase. ([zaber.com](https://www.zaber.com/products/linear-actuators/X-NA))
6. RSM-E Series User's Manual
   · The documented third-party controller route is counterevidence to an assumption of unavoidable single-supplier control dependence. ([zaber.com](https://www.zaber.com/manuals/RSM-E))

4.6. PESTLE Analysis

Cross-border access depends on the transaction, not simply on a supplier's international presence. ■■■■■ ■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■ ■■■■ ■■■ ■■■■■■■■■ ■ ■■■■■■ ■■■■■■ ■■■■■■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ Before committing to an imported assembly, the buyer should resolve product classification, origin, destination, and contractual responsibility for border-related costs.

European machinery requirements create a defined transition for covered offerings. Regulation (EU) 2023/xx.xx generally applies from January xx.xx 2027, and distinguishes machinery from partly completed machinery. ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■

RESEARCH SAMPLE REPORT

[redacted]

Intellectual-property and supplier-governance conditions also affect commercial freedom. MKS describes portfolio-level patent and trade-secret protection, but this does not establish exclusivity over an individual stage configuration. [redacted]

Sources & Evidence

1. Purchasing & Suppliers
   - PI's published purchasing process establishes a supplier-governance gate, without proving admission or future orders. ([pi-usa.us](https://www.pi-usa.us/en/about-pi/becoming-a-supplier))
2. Form 10-K for MKS Instruments Inc. for the Year Ended December 31, 2024
   - MKS identifies tariff and export-restriction risks and portfolio-level patent and trade-secret protection. ([investor.mks.com](https://investor.mks.com/static-files/a8a62959-dcbb-4d70-8db7-dafdd9784afe))
3. Terms & Conditions of Sale
   - Contractual restrictions on copying and modification are distinct from any unverified stage-specific patent exclusivity. ([newport.com.cn](https://www.newport.com.cn/terms-and-conditions-of-sale))
4. Regulation (EU) 2023/1230 - Consolidated Text, May 29, 2026
   - The consolidated regulation specifies general application from January xx.xx 2027; individual stage classification remains a separate question. ([eur-lex.europa.eu](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX%3A02023R1230-xx.xx))

4.7. Market Outlook

The Global Motion Positioning Stages outlook depends on conversion of application interest into buyer-approved supply commitments. [redacted]

The counterforce is uneven purchasing commitment. [redacted] Suppliers should distinguish approved programs from inquiries, while buyers should monitor accepted delivery, configuration and support commitments rather than infer commercial access from investment announcements.

Sources & Evidence

1. MISUMI Expands Automated Positioning Stage Production for Data Centers
   - MISUMI's January xx.xx 2026 announcement describes planned positioning-stage production investment in China and Vietnam associated with optical-transceiver equipment; it does not establish completion or an individual delivery commitment. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

2. Positioning 2026 Business Report - HOERBIGER
   · HOERBIGER attributes PI's below-expectation 2025 performance partly to weak automation demand and reduced publicly funded U.S. projects; this is a company-level observation. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

4.7.1. Near-Term Market Outlook (0-2 Years)

For 2026-2027, a concrete turning point is the EU machinery transition. ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■ ■■■ ■■■■ ■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■ ■■■■ ■■■ ■■■■■■■ ■■■■■■■■■ ■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■ ■■■ ■■ ■■■■■■■ ■■■■■■■■■■■■■■■ ■■■ ■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ Where these remain unsettled, defer the affected commitment rather than assume that a familiar catalog configuration resolves the access question.

Sources & Evidence

1. Machinery - European Commission
   · The European Commission states that the Machinery Regulation becomes mandatory on January xx.xx 2027, and distinguishes the preceding Machinery Directive regime. Applicability depends on the covered product. ([single-market-economy.ec.europa.eu](https://single-market-economy.ec.europa.eu/sectors/mechanical-engineering/machinery_en))

4.7.2. Medium-Term Market Outlook (3-5 Years)

For 2028-2029, the outlook hinges partly on whether announced supply investments become usable sourcing alternatives. MISUMI's January 2026 China and Vietnam plans provide a specific monitoring case, not assurance of completed expansion or transferable purchasing eligibility. ■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■ ■■■ ■ ■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■ ■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■ ■■ ■■■■■■■■ ■■ ■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■■■■■■ ■■■■ ■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■ ■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■ ■■ ■ ■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■■■

Sources & Evidence

1. MISUMI Expands Automated Positioning Stage Production for Data Centers
   · The announced investment supports monitoring configuration-specific delivery commitments rather than assuming that additional executable sourcing routes have already resulted. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

4.7.3. Long-Term Market Outlook (5-10 Years)

For 2030-2032, lifecycle substitutability is a more defensible planning issue than assuming universal migration to one control package. ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■

[redacted] Standardizing a broader supplier package remains an alternative where it delivers an accepted responsibility transfer; neither mixed packaging nor integration guarantees future replacement availability.

Novel architecture remains a conditional commercial option. PI identifies its presented magnetic-levitation platforms as technology demonstrators. [redacted]

Sources & Evidence

1. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
   · PI explicitly identifies its presented magnetic-levitation platforms as technology demonstrators, not standardized delivery and continuing-support commitments. ([pi-usa.us](https://www.pi-usa.us/en/tech-blog/picopositioning-maglev-6dof-linear-rotary-stages))
2. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
   · Jefferson Lab's May 2025 record documents integrated-controller linear stages alongside externally controlled rotary stages, providing a bounded institutional example of mixed packaging. ([jlab.org](https://www.jlab.org/sites/default/files/dsg/notes/2025-xx.xx.pdf))
3. Single Axis Stages | HIWIN
   · The documented third-party-motor route is counterevidence to assuming that future stage procurement must use a fully affiliated package. ([hiwin.com](https://hiwin.com/products/single-axis-stages/))

4.8. Go-to-Market Strategy

New entrants should pursue a defined assembly requirement from Equipment OEMs retaining an established motor or control platform, rather than claim equivalence to turnkey supply. [redacted] The choice should follow the responsibilities the customer will transfer; broader supply increases coordination and support obligations rather than automatically improving the proposition.

An Independent System Integrator route requires a service agreement, not merely a partnership label. [redacted] If the Direct Operator retains purchasing authority, separate stage and integration agreements may be preferable to treating the integrator as a reseller.

Channel selection should follow the manufacturer's country and product mandate. [redacted]

[redacted] A channel's sales access should not be represented as an unrestricted manufacturer-backed repair obligation.

[redacted] Separate standard assembly, commissioned engineering and continuing support obligations rather than absorb unspecified machine-level work into a hardware offer. Zaber's written-amendment requirements and adjusted quotations for extended credit illustrate why application acceptance and financing must be reconciled with the seller's agreement before commitment.

Sources & Evidence

1. Zaber's General Terms and Conditions of Sale
   · Zaber's terms require written amendments, prevail over buyer purchase terms and distinguish published-specification conformity from fitness for a particular purpose. ([zaber.com](https://www.zaber.com/documents/Zaber-General-Terms-and-Conditions-of-Sale.pdf))
2. Orders, Shipping & Warranties
   · Zaber states that extended payment terms can require an adjusted quotation, supporting separate agreement of financing and delivered scope. ([zaber.com](https://www.zaber.com/ordering))
3. Locations and Contact - Zaber
   · Zaber lists Laser 2000 (UK) as exclusive for Ireland and the United Kingdom and describes regions with direct and selected-product distributor alternatives. ([zaber.com](https://www.zaber.com/contact/))
4. KAP Consulting - Automation and Controls Integration & Programming
   · KAP Consulting advertises positioning-stage integration and machinery retrofits; its service description does not establish purchase-order ownership or reseller authority. ([kapconsultingllc.com](https://kapconsultingllc.com/automation.html))
5. Full forward integration - ETEL SA
   · ETEL's Full Forward Integration can include part or all of its listed positioning platforms, frames, isolation, electronics and software, establishing a negotiable broader delivery route rather than uniform complete-equipment responsibility. ([etel.ch](https://www.etel.ch/motion-systems/full-forward-integration/))
6. Single Axis Stages | HIWIN
   · HIWIN advertises SDXK compatibility with its own and third-party servo and stepper motors, establishing a narrower stage-supply alternative. ([hiwin.com](https://hiwin.com/products/single-axis-stages/))

5. Market Insights

5.1. Consumer Insights & End-User Perspective

For Imaging & Microscopy, an important purchasing choice is how much control and software integration the buyer retains. ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ These are conditional incentives implied by the packages, not established preferences across all buyers; the selected model and contracting buyer's requirements remain decisive.

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Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   · Zaber's ASR family offers motor-only and built-in-controller models and advertises microscopy software support, establishing alternative purchasing packages rather than observed buyer preferences. ([zaber.com](https://www.zaber.com/products/families/ASR))
2. Zaber's General Terms and Conditions of Sale
   · Zaber's terms distinguish shipment nonconformity from its published-specification warranty, disclaim fitness for a particular purpose, and require written agreement for amendments. ([zaber.com](https://www.zaber.com/documents/Zaber-General-Terms-and-Conditions-of-Sale.pdf))

5.2. Consumer Experience Benchmarking

Delivered control responsibility provides a defensible experience proxy without implying a performance league table. Zaber's X-LDQ-AE linear stages include controllers and linear encoders and offer optional local knob control. ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

Commercial reversibility is a separate benchmark. ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ Buyers should confirm eligibility before commitment rather than extend a catalog return policy to every environment-qualified or custom stage.

Sources & Evidence

1. X-LDQ-AE Features - Zaber
   · X-LDQ-AE stages include controllers and linear encoders and offer optional local knob control; these features support a delivery-scope benchmark, not comparative satisfaction or complete-machine responsibility. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE/features))
2. Orders, Shipping & Warranties
   · Zaber distinguishes standard-product returns, an opened high-vacuum-stage exclusion, and case-specific custom-product guarantees. ([zaber.com](https://www.zaber.com/ordering))

5.3. Opportunity Mapping

Qualitative priority should follow an identifiable purchasing requirement, accessible contracting party and achievable responsibility boundary. For Equipment OEMs, New Scale Technologies' M3-LS establishes an embedded stage-and-control proposition. ■■■■ ■■ ■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■■■ ■■■■■ ■■■■ ■■■ ■■■ ■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■ ■■■ ■■■ ■■■■■ ■■■■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■ ■■■■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■ ■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■ ■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■ ■■■ ■■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■ ■■■ ■■■■■■■■

Imaging & Microscopy offers a more specifically documented access route. Zaber's ASR family separates motor-only and built-in-controller packages with series-specific microscopy support, while AVR Optics has a stated microscopy appointment in Canada, Mexico and the United States. ■ ■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■ ■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■ ■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■ ■■■ ■■ ■■■■■■■■ ■■ ■■ ■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■

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■■■■■■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■ ■■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■ ■■■■ ■■■■■■■■■■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ These historical solicitations demonstrate purchasing gates, not open opportunities or awards. A bidder should verify the actual solicitation before funding representation or a bespoke offer; an authorized channel cannot repair an ineligible product-origin proposition.

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   · Zaber's ASR family separates motor-only and built-in-controller series and advertises microscopy software and mounting support, with features differing across series.
   ([zaber.com](https://www.zaber.com/products/families/ASR))
2. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA
   · PI's documented catalog-variant and requested-modification routes support considering an existing environmental offering before commissioning additional scope.
   ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
3. Locations and Contact - Zaber
   · Zaber lists AVR Optics for microscopy products and support in Canada, Mexico and the United States.
   ([zaber.com](https://www.zaber.com/contact/))
4. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
   · The solicitation demonstrates an institutional purchasing requirement extending beyond assembly delivery to installation, acceptance and support.
   ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))
5. Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System
   · IISc's June 2025 RFQ restricted bidder eligibility and expressly rejected treating local installation and related services as sufficient local value addition for imported products.
   ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))
6. Loan Service for Nanopositioners
   · attocube identifies its EC*xx.xx loan packages as ambient-condition offerings; loan engagement does not establish specialized-environment purchasing coverage.
   ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
7. Linear Micro Stages - New Scale Technologies
   · The embedded M3-LS package provides an identifiable OEM subsystem proposition; its description does not transfer finished-instrument responsibility.
   ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))
8. New Scale Technologies, Inc. - Terms and Conditions, Revision 05.06.2025
   · New Scale's terms default to its assigned part-number specifications unless different requirements are agreed in writing and exclude fitness-for-purpose warranties.
   ([newscaletech.com](https://newscaletech.com/wp-content/uploads/NewScale-Terms-Conditions_2025.pdf))

5.4. Distribution Channel Analysis

Territory and portfolio rights determine channel reach. Zaber lists Laser 2000 (UK) Ltd. as exclusive for Ireland and the United Kingdom, while Edmund Optics and Digi-Key have non-exclusive, selected-product coverage in listed territories. ■■■ ■■■■■■ ■■ ■■■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■ ■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■ ■■■■ ■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■

Where offered, direct supply provides an alternative with broader catalog access. ■■■■■■■■■■■ ■■■■■ ■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■■ Before awarding an order, buyers should identify the seller of record, service allocation and manufacturer escalation route; direct purchasing is not a presumed bypass of exclusive territorial arrangements.

Sources & Evidence

1. Locations and Contact - Zaber
   · Zaber identifies exclusive and non-exclusive territorial appointments, selected-product distributors, microscopy-specific support, and regions offering a direct-supply alternative. ([zaber.com](https://www.zaber.com/contact/))

5.5. Pricing Trend Analysis

Contract scope and risk allocation shape stage pricing beyond the selected hardware. MKS terms published on Newport's website permit adjustments for changed scope and specified manufacturing, shipping or service cost pressures, while allocating excluded charges to the purchaser. ■■■■ ■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■ ■■■■ ■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■■■■■ ■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■

Financing and trade terms create another distinction. ■■■■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■ ■■■■■■■■ ■■ ■■■■■■■■ Procurement should therefore align payment obligations with budget approval and establish transaction-specific border treatment rather than assume equivalent economics across purchasing routes.

Sources & Evidence

1. Terms & Conditions of Sale
   · The published MKS terms permit scope-related adjustments and specified cost surcharges, allocate excluded charges to the buyer, and distinguish product payment from additional intellectual-property rights. A signed agreement can supersede these terms. ([newport.com.cn](https://www.newport.com.cn/terms-and-conditions-of-sale))
2. Orders, Shipping & Warranties
   · Zaber links extended payment terms to adjusted quotations and states that applicable import tariffs are assessed through the carrier or broker. ([zaber.com](https://www.zaber.com/ordering))

5.6. Regulatory Compliance & Standards Framework

EU commercial access depends on the applicable product classification and placement date. The European Commission states that covered machinery placed on the market before January xx.xx 2027 must comply with the Machinery Directive; the Machinery Regulation becomes mandatory on that date. ■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■ ■■■■■ ■■■■■ ■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■

Substance-compliance documentation also requires a configuration and jurisdiction boundary. ■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■ ■■■■ ■■ ■■■■■■■■■■ ■■■■ ■■■ ■■■■■■ ■■■■■ ■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■ Manual,

fluid-actuated and electrically controlled offerings should not automatically receive identical classifications, and distributor participation does not itself establish compliance.

Sources & Evidence

1. Machinery - European Commission
   · The Commission states that the Machinery Regulation applies mandatorily from January xx.xx 2027, and distinguishes mandatory essential requirements from voluntary harmonized standards. ([single-market-economy.ec.europa.eu](https://single-market-economy.ec.europa.eu/sectors/mechanical-engineering/machinery_en))
2. Compliance FAQs: RoHS
   · NIST describes EU RoHS documentation obligations for covered electrical and electronic equipment and explicitly states that EU RoHS compliance does not confer China RoHS compliance. ([nist.gov](https://www.nist.gov/standardsgov/compliance-faqs-rohs))

5.7. ESG & Sustainability Analysis

ESG is documented as a supplier-governance issue at PI, rather than a demonstrated end-user preference for a stage architecture. ■■ ■■■■ ■■■■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■ ■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■ ■■■ ■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■ ■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■■■ For stage buyers, corporate monitoring does not establish an assembly's environmental footprint: configuration-specific evidence is needed before preferring manual, electric or fluid-actuated alternatives on sustainability grounds.

Sources & Evidence

1. Purchasing & Suppliers - Physik Instrumente
   · PI reports using IntegrityNext for supplier sustainability monitoring, encourages supplier registration, and identifies environmental, working-condition and anti-corruption objectives. This is supplier-governance evidence, not an assembly-level environmental comparison. ([physikinstrumente.com](https://www.physikinstrumente.com/en/about/purchasing-and-suppliers))

5.8. Disruption & Risk Scenarios

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A change of destination or application could disrupt an otherwise acceptable supply relationship through warranty coverage rather than physical product incompatibility. ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■

[redacted]
Written coverage for the actual transaction can mitigate the risk; the published restrictions are not proof of a sales prohibition or of inferior service.

Sources & Evidence

1. WARRANTY | SURUGA SEIKI CO., LTD.
   · Suruga's published warranty ties applicability to the order-confirmed delivery territory and contains application exclusions; special orders and superseding manufacturer warranties require separate consideration. ([eng.surugaseiki.com](https://eng.surugaseiki.com/warranty/))
2. Positioning 2026 Business Report - HOERBIGER
   · PI's reported public-project pressure provides a commercial counterexample to treating application interest as assured purchasing commitment. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
3. MKS Inc. Annual Report 2025
   · MKS's 2025 annual report describes capital-approval constraints, order rescheduling and cancellation, and government-funding exposure across its broader business; these are not stage-specific purchasing measurements. ([investor.mks.com](https://investor.mks.com/static-files/b9811017-fb6a-xx.xx-a2a7-c14e8fe4c97c))

5.9. Return on Investment & Cost-Benefit Analysis

From an equipment buyer's perspective, integrated supply can justify commitment when it removes separately contracted electronics and coordination responsibilities that the buyer would otherwise retain. [redacted] Where the buyer already owns the control platform, duplication and reduced selection freedom can outweigh procurement convenience.

Retention is a credible alternative to another stage purchase. Aerotech's repair policy and Zaber's X-NA micrometer-replacement actuator establish different ways to preserve an installed assembly. [redacted]

[redacted]
Custom supply can justify a firmer commitment only where the unmet need and acceptance obligations are explicit. The relevant sensitivities are retained integration work, repair exposure and contractual reversibility, rather than an assumed universal return from automation.

Sources & Evidence

1. X-NA Micro, Motorized Linear Actuators, Built-in Controllers - Zaber

   · Zaber markets X-NA actuators as replacements for standard micrometer heads on manual translation stages, establishing an accessory-led retention alternative rather than another complete-stage offering. ([zaber.com](https://www.zaber.com/products/linear-actuators/X-NA))

2. Orders, Shipping & Warranties

   · Zaber distinguishes standard-product returns, an exclusion for unpackaged high-vacuum stages and case-specific guarantees for custom products. ([zaber.com](https://www.zaber.com/ordering))

3. Linear Micro Stages - New Scale Technologies

   · M3-LS combines stage and control selection, supporting a conditional comparison between consolidated procurement and buyer-retained integration. ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))

4. New Scale Technologies, Inc. - Terms and Conditions, Revision 05.06.2025

   · The contractual distinction between supplied-part conformity and application fitness limits the responsibility transfer that can be assumed in an integrated-module investment case. ([newscaletech.com](https://newscaletech.com/wp-content/uploads/NewScale-Terms-Conditions_2025.pdf))

5. Warranty and Service Policy - Aerotech

   · Aerotech's published policy provides repair routes subject to authorization and makes field attendance and expedited service conditional, supporting assessment of retention without assuming uninterrupted operation. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/aerotech-warranty-policy.pdf))

6. Cumulative Impact of Artificial Intelligence 2026

AI has an evidenced indirect commercial connection to positioning stages through photonics equipment. Aerotech markets precision-alignment expertise around optical transceivers, silicon photonics and co-packaged optics associated with AI and high-performance computing. ■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■ ■ ■■■■■ ■■ ■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■ ■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■ ■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■ ■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■

Within electrically controlled systems, Aerotech describes APIs as a possible connection to AI analytics and predictive maintenance. That establishes integration potential, not a deployed AI service or demonstrated outcome. ■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■ ■■■■ ■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■ ■■■ ■■■ ■■■■■■■■■■■ ■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■ ■■■■■■■■■■■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■■■

Governance changes with the function purchased. ■■■■■■ ■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■ ■■■ ■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■ Connectivity alone establishes neither AI deployment nor regulatory acceptance.

Sources & Evidence

1. Machinery - European Commission
   · The Machinery Regulation addresses AI-powered safety functions and cyber-safety, making the deployed function relevant to commercial responsibility. ([single-market-economy.ec.europa.eu](https://single-market-economy.ec.europa.eu/sectors/mechanical-engineering/machinery_en))
2. How Motion Control Enables Modern Datacom Technologies
   · Aerotech connects its precision-alignment commercial positioning with optical transceivers, silicon photonics and co-packaged optics serving AI and high-performance computing. The webinar description does not establish stage orders or embedded AI deployment. ([aerotech.com](https://www.aerotech.com/how-motion-control-enables-modern-datacom-technologies/))
3. What Is Motion Control Software?
   · Aerotech describes APIs as a potential connection for AI analytics and predictive maintenance, alongside deterministic control and conventional interface tools. This supports integration potential, not verified AI deployment outcomes. ([go.aerotech.com](https://go.aerotech.com/in-motion/understanding-motion-control-software-a-comprehensive-guide))

4. AI Risk Management Framework

· NIST identifies its AI Risk Management Framework as voluntary guidance for incorporating trustworthiness considerations into AI products, services and systems.
([nist.gov](https://www.nist.gov/itl/ai-risk-management-framework))

7. Motion Positioning Stages Market, by Stage Configuration

[illegible] For Single-Axis Goniometer and Tilt Stages, Zaber's X-GSM-E offering includes rotation-center options intended to support common-center angular combinations. Modular procurement preserves selection flexibility, but the specifications of individual axes do not establish acceptance of the assembled arrangement.

[illegible] Multi-Axis Angular Stages present a different purchasing requirement, such as the common-center goniometer arrangement advertised by Zaber. Buyers should identify the delivered assembly and responsibility for its combined operation rather than assume that individually acceptable axes constitute an accepted multi-axis system.

Combined Translation-Angular Stages are not limited to automated hexapods. PI's H-xx.xx offers translational and rotational positioning with associated coordinate-system software, while the Indian Institute of Science's 2022 manual waveguide-alignment tender requested integrated linear and rotational positioning on a common base. [illegible]

Figure 8. Global Motion Positioning Stages Market Size, by Stage Configuration, 2025 (%)

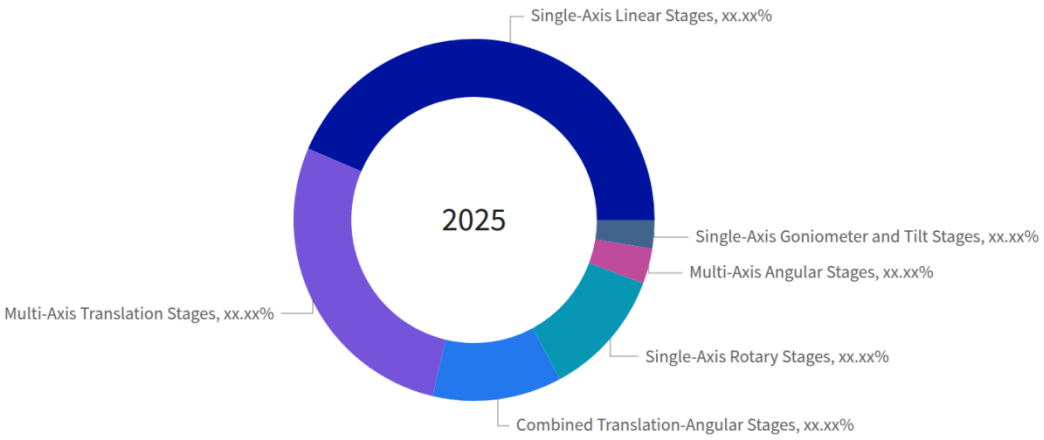


Figure 9. Global Motion Positioning Stages Market, by Stage Configuration, 2032 (USD Million)

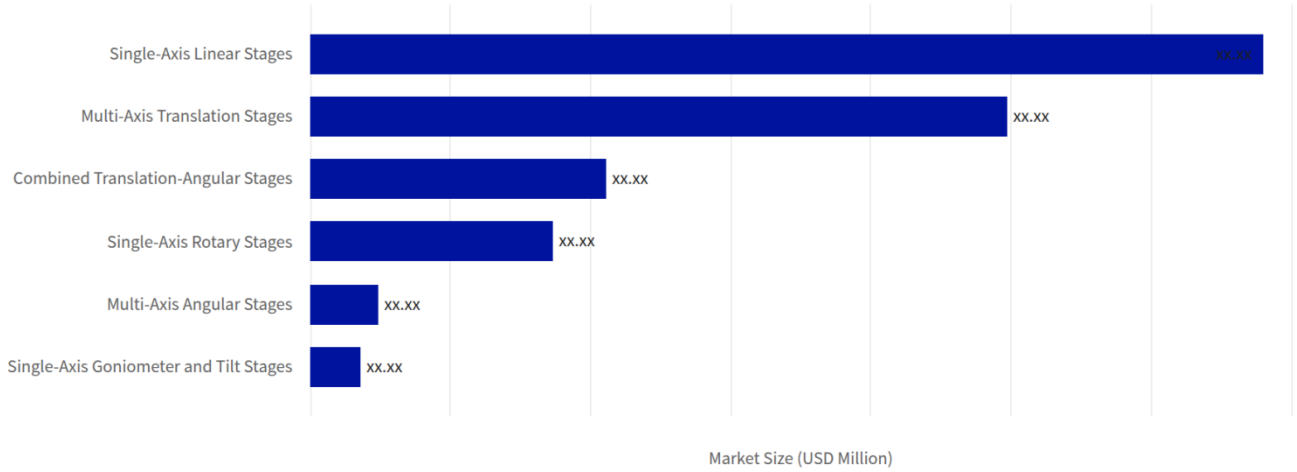


Table 4. Global Motion Positioning Stages Market, by Stage Configuration growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 5. Global Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   - ASR is an XY microscope-stage family with built-in-controller or motor-only models and microscope mounting options.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
2. X-GSM-E Motorized Goniometer & Tilting Stages - Zaber
   - Zaber offers X-GSM-E goniometers with rotation-center options intended to allow angular motion about a common center.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
3. RSM-E Motorized Rotation Stages, Built-in Motor Encoders - Zaber
   - RSM-E is an official motorized rotation-stage offering.
4. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
   - H-xx.xx specifies translational and rotational active axes and describes coordinate-system software associated with the hexapod controller.

5. Global tender for a manual waveguide alignment rig - Indian Institute of Science
   - The October xx.xx 2022 tender requests input and output XYZ positioning and central linear/rotational positioning integrated on a common base.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
6. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics
   - The product listing identifies a linear X-axis positioning stage.
7. U. R. Rao Satellite Centre - Tender for 6-Axis Positioning System, URSC/CE/IS202500012301
   - Taxonomy evidence: The October xx.xx 2025 public tender identifies a six-axis Stewart-platform/hexapod positioning system and separately lists the platform, controller and accessories, and installation-related supply. This corroborates procurement of an integrated multi-axis stage offering rather than treating each constituent axis as a separate finished-stage purchase. The tender is not an award record. ([eproc.isro.gov.in](https://eproc.isro.gov.in/viewDocumentPT?tenderId=IS202500012301))
8. IIT Hyderabad - Supply of Linear Stage, Single Tender IITH/PHY/YOGESH/2023/S/T090
   - Taxonomy evidence: The February xx.xx 2024 procurement separately specifies single-X-axis linear stages, electric stepper motors, metric lead screws, and a recirculating-ball guide, supporting separation of configuration, actuation, transmission, and guidance.
9. IISER Berhampur - Notice Inviting Tender IISERBpr/S&P/2024-25/06
   - Taxonomy evidence: The May xx.xx 2024 requirements separately list goniometers, a manual rotation stage, a manual translation stage, and a two-axis tip-tilt platform.
10. Positioning 2026 Business Report - HOERBIGER
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
11. MKS Inc. Annual Report 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
12. SIGMAKOKI Integrated Report 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
13. MISUMI Integrated Report 2025 - Business Portfolio
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.

14. Festo Sustainability Report 2025 - Festo at a Glance
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
15. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
16. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
17. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
18. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
19. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

20. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.

21. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
22. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.

23. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
24. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
25. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
26. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
27. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
28. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
29. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

30. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
31. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
32. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
33. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
34. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
35. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

7.1. Single-Axis Linear Stages

Table 6. Global Motion Positioning Stages Market Size, by Single-Axis Linear Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 7. Global Motion Positioning Stages Market Size, by Single-Axis Linear Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 8. Global Motion Positioning Stages Market Size, by Single-Axis Linear Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Hyderabad - Supply of Linear Stage, Single Tender IITH/PHY/YOGESH/2023/S/T090
   - Taxonomy evidence: The purchase requirements identify linear stages with X as the active positioning axis.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
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10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
29. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.

7.2. Multi-Axis Translation Stages

Table 9. Global Motion Positioning Stages Market Size, by Multi-Axis Translation Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 10. Global Motion Positioning Stages Market Size, by Multi-Axis Translation Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 11. Global Motion Positioning Stages Market Size, by Multi-Axis Translation Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Indian Institute of Science - Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly
   - Taxonomy evidence: The full-assembly tender specifies XYZ positioning, with piezo actuation for X and Y and a manual screw-gauge Z adjustment.

2. Indian Institute of Science - Tender Notification for the Procurement of 3-Axis Piezo Stage for Microscopy
   · Taxonomy evidence: The November xx.xx 2017 procurement requests one three-axis piezo stage with X, Y, and Z active axes.
3. Positioning 2026 Business Report - HOERBIGER
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
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    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.

15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.

22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

7.3. Combined Translation-Angular Stages

Table 12. Global Motion Positioning Stages Market Size, by Combined Translation-Angular Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 13. Global Motion Positioning Stages Market Size, by Combined Translation-Angular Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 14. Global Motion Positioning Stages Market Size, by Combined Translation-Angular Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Delhi - Multiaxes Precision CNC Stage for Femtosecond Laser Micromachining System

   · Taxonomy evidence: The institutional tender published August xx.xx 2024 requests one integrated stage system containing X, Y, and Z positioning plus a rotary B axis. This directly supports combined translation-angular complete-stage demand, not an awarded contract or realized sale. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
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    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
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    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
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26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.

7.4. Single-Axis Rotary Stages

Table 15. Global Motion Positioning Stages Market Size, by Single-Axis Rotary Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 16. Global Motion Positioning Stages Market Size, by Single-Axis Rotary Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 17. Global Motion Positioning Stages Market Size, by Single-Axis Rotary Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IISER Berhampur - Notice Inviting Tender IISERBpr/S&P/2024-25/06

   · Taxonomy evidence: The tender requests a manual rotation stage with continuous angular movement and engraved graduations.

2. Air-Hydraulics - Rotary Indexing Table
   - Taxonomy evidence: The brochure presents externally supplied rotary indexing tables as complete products. Their eligibility remains subject to the positioning-versus-conveyance boundary.
3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
8. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

10. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.

15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.

7.5. Multi-Axis Angular Stages

Table 18. Global Motion Positioning Stages Market Size, by Multi-Axis Angular Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 19. Global Motion Positioning Stages Market Size, by Multi-Axis Angular Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 20. Global Motion Positioning Stages Market Size, by Multi-Axis Angular Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IISER Berhampur - Notice Inviting Tender IISERBpr/S&P/2024-25/06
   - Taxonomy evidence: The tip-tilt platform requirement identifies two active angular axes; its bundled mirror does not establish a separately attributable stage value.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
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5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
29. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.

7.6. Single-Axis Goniometer and Tilt Stages

Table 21. Global Motion Positioning Stages Market Size, by Single-Axis Goniometer and Tilt Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 22. Global Motion Positioning Stages Market Size, by Single-Axis Goniometer and Tilt Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 23. Global Motion Positioning Stages Market Size, by Single-Axis Goniometer and Tilt Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IISER Berhampur - Notice Inviting Tender IISERBpr/S&P/2024-25/06
   - Taxonomy evidence: Separate goniometer line items specify angular positioning about an elevated point of rotation.

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.

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    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

28. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

8. Motion Positioning Stages Market, by Actuation Mode

Mixed-Actuation Stages can reflect an explicit purchasing choice rather than incomplete automation. The Indian Institute of Science's November xx.xx 2025 tender requested powered piezo positioning in X and Y alongside manual screw adjustment in Z, with controller and automation compatibility required for the powered portion. ■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■ ■■■ ■■■■■■ ■■ ■■■■■■■■■■■ ■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■■ ■ ■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■ ■■■■■■■■ ■■■■■■■■■■

Drive-Ready Stages preserve buyer control over motor selection but can transfer integration risk. MISUMI's published motorless-stage catalog retains a ball-screw transmission while excluding motor-installation-related problems and accuracy after customer motor installation from its stated guarantee. ■■ ■■■ ■■■■■■■■■■ ■■■ ■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■ ■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■ ■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■ ■■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■

Pneumatically Actuated Stages and Hydraulically Actuated Stages require a separate assessment of utility and package scope. ■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■ ■■■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■■■■■ ■■■■ ■■ ■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■■ The brochure does not establish equivalence to every electrically actuated positioning package or the configuration available for an individual order.

Figure 10. Global Motion Positioning Stages Market Size, by Actuation Mode, 2025 (%)

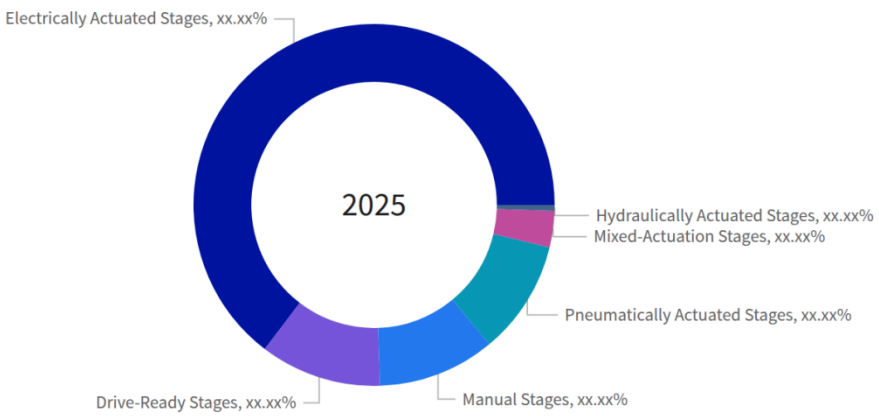


Figure 11. Global Motion Positioning Stages Market, by Actuation Mode, 2032 (USD Million)

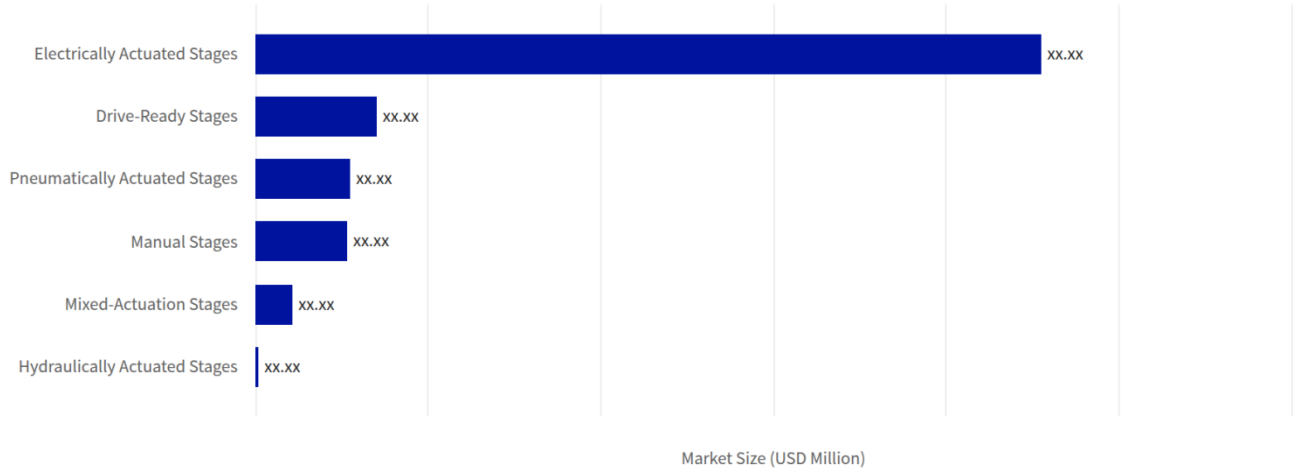


Table 24. Global Motion Positioning Stages Market, by Actuation Mode growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 25. Global Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Global tender for the supply and installation of piezo actuated Linear XYZ stage with full assembly - Indian Institute of Science
   - The November xx.xx 2025 full-assembly tender specifies piezo-actuated X/Y positioning and manual screw-gauge Z positioning, with controller and automation compatibility for the powered portion. This establishes requested mixed actuation, not an award.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
2. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
   - MISUMI's motorless Z-axis stage catalog identifies an installed ball screw and limits guarantees concerning customer motor installation and accuracy afterward. These are published catalog provisions, not verified terms for a new order.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
3. Rotary Indexing Table - Air-Hydraulics
   - Air-Hydraulics describes pneumatic indexing tables, a separate power-system option, electrical sensing, and hydraulic-powered indexing for Model xx.xx.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.
4. IIT Hyderabad - Supply of Linear Stage, Single Tender IITH/PHY/YOGESH/2023/S/T090
   - Taxonomy evidence: Separate motor, screw, and guide fields establish that motive power is not interchangeable with transmission or bearing classification.

5. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
6. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
7. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
8. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.

9. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
10. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
11. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
12. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
13. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
14. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
15. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
16. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

17. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
18. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
19. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
20. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
21. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
22. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
23. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.

24. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
26. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
27. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
28. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
29. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.

30. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.

8.1. Electrically Actuated Stages

Table 26. Global Motion Positioning Stages Market Size, by Electrically Actuated Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 27. Global Motion Positioning Stages Market Size, by Electrically Actuated Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 28. Global Motion Positioning Stages Market Size, by Electrically Actuated Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Hyderabad - Supply of Linear Stage, Single Tender IITH/PHY/YOGESH/2023/S/T090
   - Taxonomy evidence: The requested linear stages specify two-phase stepper-motor actuation.
2. Indian Institute of Science - Tender Notification for the Procurement of 3-Axis Piezo Stage for Microscopy
   - Taxonomy evidence: The procurement establishes demand for an electrically actuated piezo stage, without independently specifying its final transmission subtype.
3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
8. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

10. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
27. Locations and Contact - Zaber
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. ASR Family - Motorized XY Microscope Stages - Zaber
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
30. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
31. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
32. Electromechanical Actuators - Festo
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
33. Simple Electric Automation Solution - Festo USA
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.

8.2. Drive-Ready Stages

Table 29. Global Motion Positioning Stages Market Size, by Drive-Ready Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 30. Global Motion Positioning Stages Market Size, by Drive-Ready Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 31. Global Motion Positioning Stages Market Size, by Drive-Ready Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. MISUMI - Motorless Stages: Z-Axis Level Cross Roller Guide
   - Taxonomy evidence: The supplier catalog explicitly presents motorless Z-axis stages and distinguishes them from products supplied with motors.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
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11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
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12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
29. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
30. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.

8.3. Manual Stages

Table 32. Global Motion Positioning Stages Market Size, by Manual Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 33. Global Motion Positioning Stages Market Size, by Manual Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 34. Global Motion Positioning Stages Market Size, by Manual Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IISER Berhampur - Notice Inviting Tender IISERBpr/S&P/2024-25/06
   - Taxonomy evidence: Manual translation and manual rotation stages appear as distinct purchasable requirements.

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.

7. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

8.4. Pneumatically Actuated Stages

Table 35. Global Motion Positioning Stages Market Size, by Pneumatically Actuated Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 36. Global Motion Positioning Stages Market Size, by Pneumatically Actuated Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 37. Global Motion Positioning Stages Market Size, by Pneumatically Actuated Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Air-Hydraulics - Rotary Indexing Table
   - Taxonomy evidence: The supplier brochure advertises complete pneumatic rotary indexing tables and states that their indexing movement does not require electric motors.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
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12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
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    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
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    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
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    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
29. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
30. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.

8.5. Mixed-Actuation Stages

Table 38. Global Motion Positioning Stages Market Size, by Mixed-Actuation Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 39. Global Motion Positioning Stages Market Size, by Mixed-Actuation Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 40. Global Motion Positioning Stages Market Size, by Mixed-Actuation Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Indian Institute of Science - Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly

   · Taxonomy evidence: The requested assembly combines powered piezo positioning with a separately manual positioning axis, establishing a genuine mixed-actuation purchase configuration.

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.

8.6. Hydraulically Actuated Stages

Table 41. Global Motion Positioning Stages Market Size, by Hydraulically Actuated Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 42. Global Motion Positioning Stages Market Size, by Hydraulically Actuated Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 43. Global Motion Positioning Stages Market Size, by Hydraulically Actuated Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Air-Hydraulics - Rotary Indexing Table
   - Taxonomy evidence: The brochure lists hydraulic-powered indexing as an option for its Model xx.xx; this establishes an own-product option, not universal industrial-table inclusion.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

9. Motion Positioning Stages Market, by Drive Mechanism

[illegible] Edmund Optics separately specifies Rack-and-Pinion Drives in its translation-stage offering, Zaber identifies worm gearing in RSM-E stages relevant to Rotary Gear Drives, and PI's linear-stage overview identifies lead-screw and ball-screw offerings relevant to Screw Drives. These are documented supply alternatives, not interchangeable packages.

[illegible] Within Direct Piezoelectric Drives, buyers should preserve the distinction between Piezoelectric Deformation Drives and Piezoelectric Motor Drives in the quotation rather than treat a piezo actuation label as a complete mechanism specification. A replacement decision still depends on the supplied stage, controls, and accepted application requirements.

Compound descriptions make procurement documentation important for Cam, Wedge, and Linkage Drives and Hybrid and Mixed Drives. Newport's published IDL280-Z20 description identifies both a ball screw and a wedge arrangement; PI describes M-xx.xx as a hybrid piezo-and-servo-motor stage. [illegible]

[illegible] For cable-driven variants, Friction-Roller Drives, and direct Fluid-Pressure Drives, a defensible supplier shortlist still requires a named complete-stage offering and delivery commitment. Neighboring belt-drive or fluid-actuation examples do not establish those commercial alternatives.

Figure 12. Global Motion Positioning Stages Market Size, by Drive Mechanism, 2025 (%)

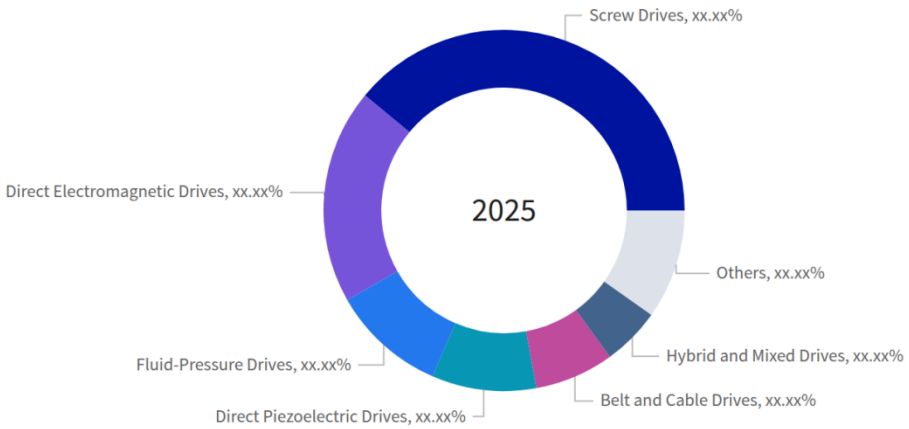


Figure 13. Global Motion Positioning Stages Market, by Drive Mechanism, 2032 (USD Million)

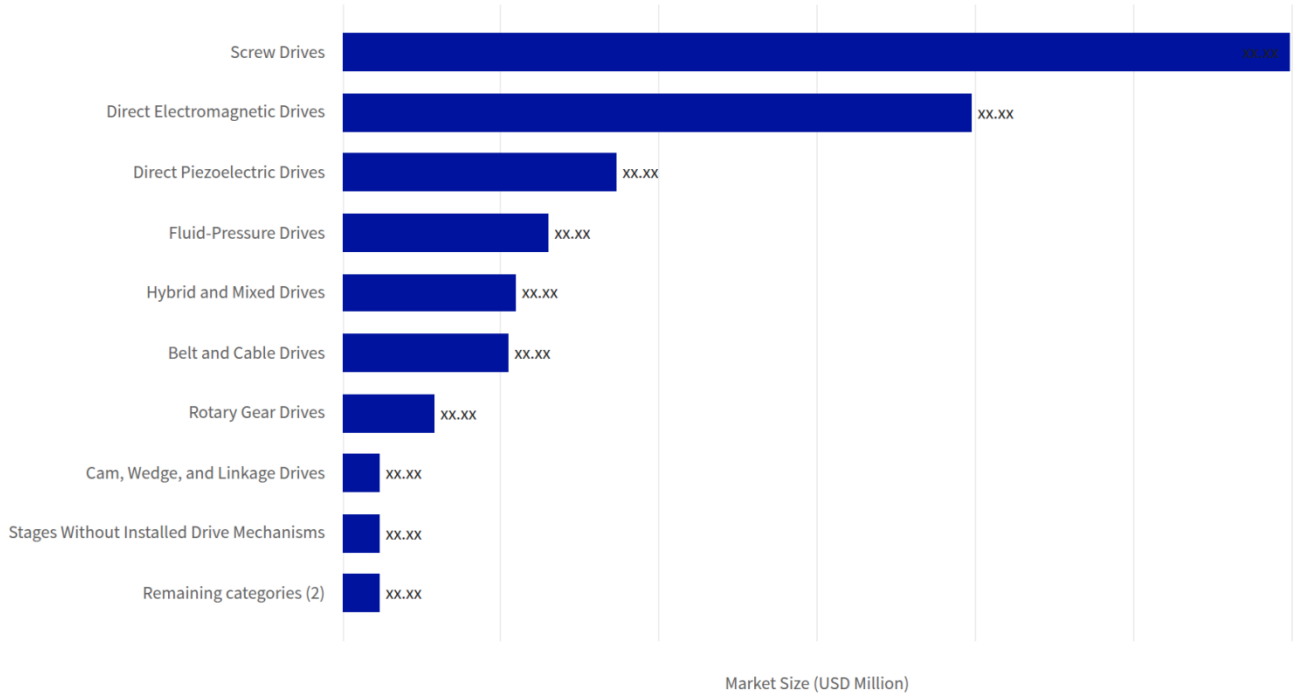


Table 44. Global Motion Positioning Stages Market, by Drive Mechanism growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 45. Global Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. X-LDQ-AE Features - Zaber
   - Zaber describes X-LDQ-AE as a motorized linear-motor stage.
2. RSM-E Motorized Rotation Stages, Built-in Motor Encoders - Zaber
   - Zaber identifies worm gearing in its RSM-E rotation-stage offering, supporting a product-specific rotary-gear distinction.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))
3. Rotary Indexing Table - Air-Hydraulics
   - The brochure establishes fluid-actuated indexing offerings but does not independently identify a direct fluid-pressure drive mechanism; this limits inference to neighboring drive categories.
4. LC40 Features - Zaber
   - LC40 is offered with a synchronous belt drive or as a passive guide; motor-ready and all-in-one supply are distinguished. The passive-guide description requires a transaction-specific complete-assembly boundary.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

5. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics
   - The seller specifies rack-and-pinion drive for the complete listed stage.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
6. Linear Translation Stages and NanoPositioners Overview - PI USA
   - PI identifies lead-screw and ball-screw stage offerings, direct-drive piezo-actuator stages, ultrasonic piezo-motor stages, and the M-xx.xx hybrid piezo/servo-motor stage. The overview establishes documented configurations, not transaction-specific availability.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
7. IDL280-Z20 Industrial Vertical Stage - Newport
   - Newport's published IDL280-Z20 description identifies a wedge arrangement together with a ball-screw drive, illustrating compound mechanism terminology without establishing new-order availability.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))
8. Indian Institute of Science - Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly
   - Taxonomy evidence: The November xx.xx 2025 tender specifies piezoelectric actuation for X and Y and manual screw adjustment for Z, establishing different supplied actuation provisions. The requirement does not identify the powered axes' final transmission. Analytical consequence: it cannot independently verify allocation to different drive-mechanism peers merely from the actuator labels. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Global-Tender_XYZ_stage_piezo-xx.xx.pdf))
9. Dynamic Modelling of a Single-Axis Belt-Drive System
   - Taxonomy evidence: Its described belt-driven stage uses a geared DC motor, illustrating that the input motor and the platform transmission are different classification facts.

10. Positioning 2026 Business Report - HOERBIGER

· Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

11. MKS Inc. Annual Report 2025

· Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

12. SIGMAKOKI Integrated Report 2025

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))

13. MISUMI Integrated Report 2025 - Business Portfolio
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
14. Festo Sustainability Report 2025 - Festo at a Glance
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
15. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
16. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
17. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
18. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
19. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

20. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
21. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
22. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
23. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
24. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
25. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
26. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
27. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

28. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
29. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
30. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))
31. X-LDQ-AE Precision Linear Motor Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
32. Precision Slide Table with Recirculating Bearings - MXQ - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

33. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group
    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified.
    ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641113.pdf))
34. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages
    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume.
    ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

9.1. Screw Drives

Table 46. Global Motion Positioning Stages Market Size, by Screw Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 47. Global Motion Positioning Stages Market Size, by Screw Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 48. Global Motion Positioning Stages Market Size, by Screw Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Hyderabad - Supply of Linear Stage, Single Tender IITH/PHY/YOGESH/2023/S/T090
   · Taxonomy evidence: Metric lead screws are explicitly identified separately from the stepper motors.
2. MISUMI - Motorless Stages: Z-Axis Level Cross Roller Guide
   · Taxonomy evidence: The motorless product's commercial specification separately identifies its ball screw, showing that absence of a motor does not mean absence of a transmission.
3. Positioning 2026 Business Report - HOERBIGER
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue.
   ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

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12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
30. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

9.2. Direct Electromagnetic Drives

Table 49. Global Motion Positioning Stages Market Size, by Direct Electromagnetic Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 50. Global Motion Positioning Stages Market Size, by Direct Electromagnetic Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 51. Global Motion Positioning Stages Market Size, by Direct Electromagnetic Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ABTech - Oil Hydrostatic Linear Stages
   - Taxonomy evidence: The supplier identifies linear motors and encoders integrated with controls for its hydrostatic stage offering.
2. PI - Linear Translation Stages and NanoPositioners Overview
   - Taxonomy evidence: Magnetic linear motors are identified as a drive option for PI's translation stages, separately from their guidance.
3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
8. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
10. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. X-LDQ-AE Precision Linear Motor Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

9.3. Fluid-Pressure Drives

Table 52. Global Motion Positioning Stages Market Size, by Fluid-Pressure Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 53. Global Motion Positioning Stages Market Size, by Fluid-Pressure Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 54. Global Motion Positioning Stages Market Size, by Fluid-Pressure Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
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    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

25. Locations and Contact - Zaber
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

27. Precision Slide Table with Recirculating Bearings - MXQ - SMC
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

9.4. Direct Piezoelectric Drives

Table 55. Global Motion Positioning Stages Market, by Direct Piezoelectric Drives growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 56. Global Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 57. Global Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 58. Global Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. PI - Linear Translation Stages and NanoPositioners Overview

   · Taxonomy evidence: PI describes its piezo-linear-motor positioning offerings as avoiding drive screws and gears, supporting an own-offering direct-piezo mechanism distinction.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

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   ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
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    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.

· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise.
([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.

· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

9.4.1. Piezoelectric Deformation Drives

Table 59. Global Motion Positioning Stages Market Size, by Piezoelectric Deformation Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 60. Global Motion Positioning Stages Market Size, by Piezoelectric Deformation Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 61. Global Motion Positioning Stages Market Size, by Piezoelectric Deformation Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
3. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
4. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
5. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
6. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

8. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
19. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

25. Locations and Contact - Zaber
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
27. Linear Translation Stages and NanoPositioners Overview - PI USA
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

9.4.2. Piezoelectric Motor Drives

Table 62. Global Motion Positioning Stages Market Size, by Piezoelectric Motor Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 63. Global Motion Positioning Stages Market Size, by Piezoelectric Motor Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 64. Global Motion Positioning Stages Market Size, by Piezoelectric Motor Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. PI - Linear Translation Stages and NanoPositioners Overview

   · Taxonomy evidence: The page identifies piezo linear motors separately from rotary stepper and servo motors in its positioning-stage offering.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

9.5. Belt and Cable Drives

Table 65. Global Motion Positioning Stages Market Size, by Belt and Cable Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 66. Global Motion Positioning Stages Market Size, by Belt and Cable Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 67. Global Motion Positioning Stages Market Size, by Belt and Cable Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Dynamic Modelling of a Single-Axis Belt-Drive System
   - Taxonomy evidence: The peer-reviewed article identifies belt-driven positioning stages as an industrial positioning family and distinguishes them from lead- or ball-screw stages. It does not establish cable-stage coverage.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
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4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
6. Festo Sustainability Report 2025 - Festo at a Glance
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    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. LC40 Features - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

9.6. Hybrid and Mixed Drives

Table 68. Global Motion Positioning Stages Market Size, by Hybrid and Mixed Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 69. Global Motion Positioning Stages Market Size, by Hybrid and Mixed Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 70. Global Motion Positioning Stages Market Size, by Hybrid and Mixed Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Indian Institute of Science - Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly

   · Taxonomy evidence: Piezo positioning elements and a screw-gauge positioning element are specified within the same complete stage assembly, supporting a mixed-mechanism allocation rather than separate finished-stage counts.

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.

· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase.
([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.

· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

28. Linear Translation Stages and NanoPositioners Overview - PI USA
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

29. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

9.7. Rotary Gear Drives

Table 71. Global Motion Positioning Stages Market Size, by Rotary Gear Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 72. Global Motion Positioning Stages Market Size, by Rotary Gear Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 73. Global Motion Positioning Stages Market Size, by Rotary Gear Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Development of Combined Microstructure and Structure Characterization Facility for In Situ and Operando Studies at the Advanced Photon Source

   · Taxonomy evidence: The 2018 institutional research paper describes an angularly encoded rotation stage coupled through worm gearing to a stepping motor, separately from later direct-drive replacements. It independently establishes a geared rotary-stage use distinction, but not a current offering or a 2025 merchant-stage transaction. ([tsapps.nist.gov](https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=xx.xx))

2. Zaber - RSM-E Motorized Rotation Stages, Built-in Motor Encoders

   · Taxonomy evidence: The inspected RSM-E product page explicitly identifies worm-gear-driven motorized rotation stages and presents a purchasable stage model. This is current own-offering corroboration of geared rotary supply, not proof of 2025 sales, market-wide prevalence, or the configured position-servo loop. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion.
   ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
8. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.

9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
10. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.

14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

9.8. Stages Without Installed Drive Mechanisms

Table 74. Global Motion Positioning Stages Market Size, by Stages Without Installed Drive Mechanisms, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 75. Global Motion Positioning Stages Market Size, by Stages Without Installed Drive Mechanisms, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 76. Global Motion Positioning Stages Market Size, by Stages Without Installed Drive Mechanisms, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
3. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
4. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
5. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
6. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

8. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

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    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
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    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
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    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
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    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
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    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
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    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

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    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
27. LC40 Features - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
28. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

9.9. Cam, Wedge, and Linkage Drives

Table 77. Global Motion Positioning Stages Market Size, by Cam, Wedge, and Linkage Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 78. Global Motion Positioning Stages Market Size, by Cam, Wedge, and Linkage Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 79. Global Motion Positioning Stages Market Size, by Cam, Wedge, and Linkage Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
4. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
5. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
6. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
19. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
25. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
27. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

9.10. Rack-and-Pinion Drives

Table 80. Global Motion Positioning Stages Market Size, by Rack-and-Pinion Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 81. Global Motion Positioning Stages Market Size, by Rack-and-Pinion Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 82. Global Motion Positioning Stages Market Size, by Rack-and-Pinion Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Edmund Optics - 60mm Travel, X-Axis Rack & Pinion Stage

   · Taxonomy evidence: The inspected product-specific commercial listing identifies a complete X-axis stage with dovetail guidance and rack-and-pinion drive, separately specifying movement, guide system, and drive. This establishes the seller's own offering only, not an exhaustive taxonomy, independent buyer adoption, or historical 2025 availability. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
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3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
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6. Festo Sustainability Report 2025 - Festo at a Glance
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

9.11. Friction-Roller Drives

Table 83. Global Motion Positioning Stages Market Size, by Friction-Roller Drives, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 84. Global Motion Positioning Stages Market Size, by Friction-Roller Drives, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 85. Global Motion Positioning Stages Market Size, by Friction-Roller Drives, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Investigation of the Microscopic Performance of an Aerostatic Precision Positioning Stage Driven by the Air-Lubricated Friction Drive
   - Taxonomy evidence: The engineering paper explicitly studies a precision positioning stage driven by a friction drive; it does not establish a merchant-stage transaction.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
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13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
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    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
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    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
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    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
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    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
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    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
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    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified.
      ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

10. Motion Positioning Stages Market, by Guidance Technology

[illegible] Matching the drive mechanism therefore does not establish an acceptable replacement. An OEM preserving an existing equipment interface should compare the documented complete-stage configuration rather than use guidance or drive labels as proxies for interchangeability.

Flexure-Guided Stages and fluid-supported guidance create different purchasing boundaries. [illegible] Buyers should establish whether supporting utility equipment and its service obligations are included before treating these packages as alternatives to an existing mechanically guided stage.

Magnetically Levitated Stages require particular care when distinguishing demonstrated capability from purchasable delivery scope. [illegible] This limitation concerns the documented PI examples, not the existence of the category elsewhere.

[illegible] PI's F-xx.xx description combines a flexure-guided NanoCube and a hexapod, but those product labels alone do not establish every constituent's guidance classification. Buyers should obtain the quoted guidance configuration and an accountable service boundary before relying on a mixed-guidance designation.

Figure 14. Global Motion Positioning Stages Market Size, by Guidance Technology, 2025 (%)

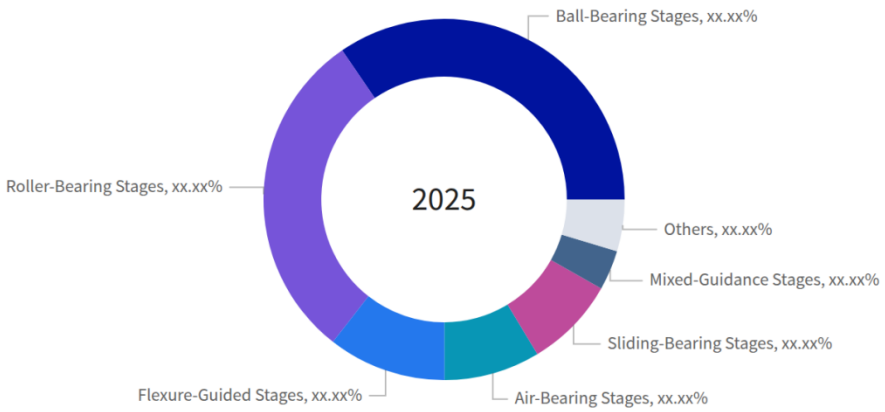


Figure 15. Global Motion Positioning Stages Market, by Guidance Technology, 2032 (USD Million)

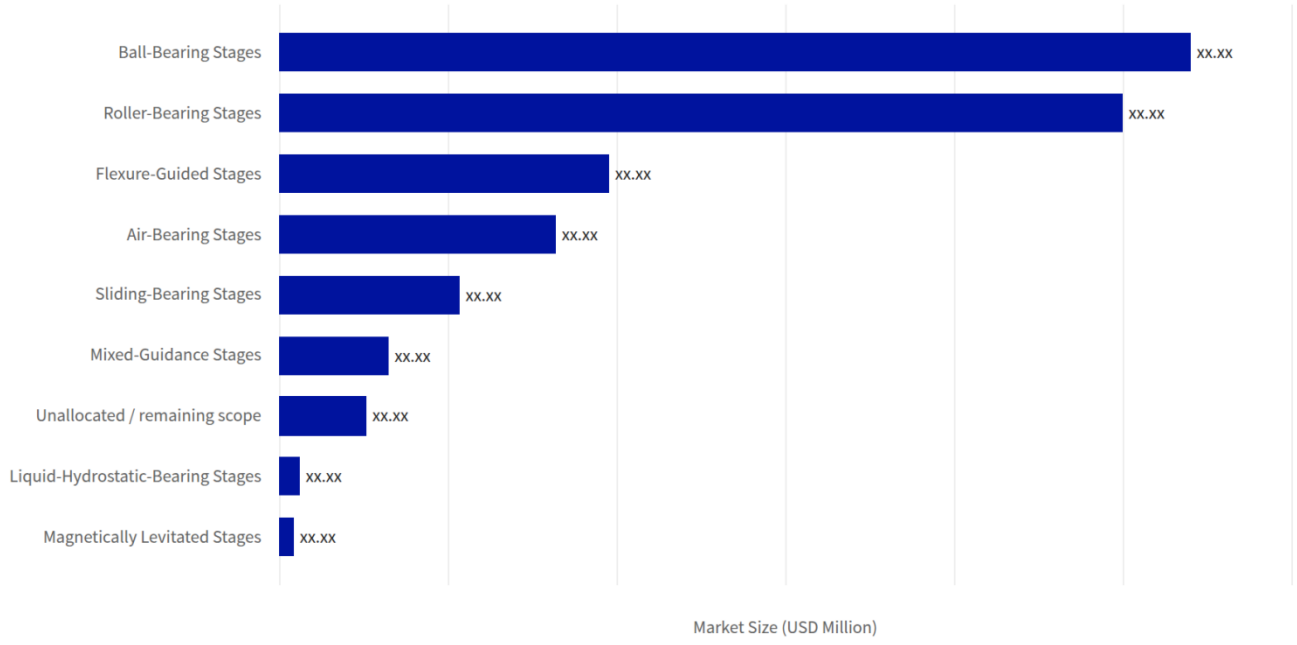


Table 86. Global Motion Positioning Stages Market, by Guidance Technology growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 87. Global Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. LC40 Features - Zaber
   - Zaber specifies recirculating-ball guidance for LC40, separately from the optional belt drive.
2. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics
   - The listing separately specifies dovetail guidance and rack-and-pinion drive, supporting guidance/drive independence.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.
3. Linear Translation Stages and NanoPositioners Overview - PI USA
   - PI separately identifies crossed-roller guidance within its translation-stage offering.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
4. Oil Hydrostatic Linear Stages - ABTech
   - ABTech describes oil-hydrostatic stages, associated hydrostatic pump units, and integrated linear motors, encoders, and application-specific controls. Guidance and actuation are separately identified; quotation inclusions remain to be agreed.
   - Taxonomy evidence: The stage page separately describes hydrostatic guidance and integrated linear motors, supporting independence of guidance from motive drive.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
5. ABL9000 Series - Aerotech
   - Aerotech's published ABL9000 specification includes an air-supply requirement, supporting verification of utility scope without reproducing operating parameters.

6. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
   - PI explicitly labels its named magnetic-levitation positioning platforms as technology demonstrators and invites application discussions. This does not establish a standard delivery or support agreement.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
7. F-712.Hxx Compact, High-Speed 6-DOF Photonics Alignment Systems - PI
   - F-xx.xx combines a hexapod and a flexure-guided NanoCube; those labels alone are insufficient to establish every constituent's guidance classification.
8. Cost and Performance Trade-Offs for Commercially Available Linear Stages
   - Taxonomy evidence: The academic comparison classifies commercially available manual linear stages by their bearing principles; its sample is not a complete Global market partition.
9. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
10. MKS Inc. Annual Report 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
11. SIGMAKOKI Integrated Report 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
12. MISUMI Integrated Report 2025 - Business Portfolio
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.

13. Festo Sustainability Report 2025 - Festo at a Glance
· Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
14. Festo startet optimistisch ins Jubiläumsjahr
· Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
· Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
15. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
· Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
16. Aerotech Recruiting FAQs
· Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
17. Novanta Announces Agreement to Acquire Motion Solutions
· Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
18. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
· Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
· Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
19. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
· Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
· Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
20. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
· Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

21. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
22. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
23. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
24. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
25. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
26. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.

27. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
28. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
29. Linear Actuator - THK Official Web Site
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.
30. Mini slide DGST - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

31. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
32. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
33. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
34. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
35. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

10.1. Ball-Bearing Stages

Table 88. Global Motion Positioning Stages Market Size, by Ball-Bearing Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 89. Global Motion Positioning Stages Market Size, by Ball-Bearing Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 90. Global Motion Positioning Stages Market Size, by Ball-Bearing Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Hyderabad - Supply of Linear Stage, Single Tender IITH/PHY/YOGESH/2023/S/T090
   - Taxonomy evidence: The longer-travel stage requirement explicitly identifies a recirculating-ball-bearing guide.
2. Cost and Performance Trade-Offs for Commercially Available Linear Stages
   - Taxonomy evidence: Ball-bearing and gothic-arch ball-bearing stages are identified among the commercial stage classes studied.
3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
8. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
10. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
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16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
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17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
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    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. Linear Actuator - THK Official Web Site
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.
30. Mini slide DGST - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.
31. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.

32. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.

10.2. Roller-Bearing Stages

Table 91. Global Motion Positioning Stages Market Size, by Roller-Bearing Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 92. Global Motion Positioning Stages Market Size, by Roller-Bearing Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 93. Global Motion Positioning Stages Market Size, by Roller-Bearing Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Cost and Performance Trade-Offs for Commercially Available Linear Stages
   - Taxonomy evidence: Crossed-roller stages are treated separately from ball-bearing stages.
2. MISUMI - Motorless Stages: Z-Axis Level Cross Roller Guide
   - Taxonomy evidence: The catalog identifies crossed-roller guidance for its motorless Z-axis stage.
3. Air-Hydraulics - Rotary Indexing Table
   - Taxonomy evidence: The advertised positioning tables specify tapered-roller-bearing construction.
4. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

5. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
6. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
7. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
8. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
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    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
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    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
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    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.

22. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
23. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

26. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
27. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
28. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
29. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
30. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
31. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
32. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

10.3. Flexure-Guided Stages

Table 94. Global Motion Positioning Stages Market Size, by Flexure-Guided Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 95. Global Motion Positioning Stages Market Size, by Flexure-Guided Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 96. Global Motion Positioning Stages Market Size, by Flexure-Guided Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Cost and Performance Trade-Offs for Commercially Available Linear Stages
   - Taxonomy evidence: Flexure stages are identified as a distinct commercially available guidance class.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

10.4. Air-Bearing Stages

Table 97. Global Motion Positioning Stages Market Size, by Air-Bearing Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 98. Global Motion Positioning Stages Market Size, by Air-Bearing Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 99. Global Motion Positioning Stages Market Size, by Air-Bearing Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. PI - Linear Translation Stages and NanoPositioners Overview
   - Taxonomy evidence: PI's own stage overview describes magnetic linear-motor stages with air-bearing guidance.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
2. Investigation of the Microscopic Performance of an Aerostatic Precision Positioning Stage Driven by the Air-Lubricated Friction Drive
   - Taxonomy evidence: The same stage is identified as aerostatic, demonstrating that the guidance principle is distinct from its friction-drive mechanism.

3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
8. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

10. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

27. Locations and Contact - Zaber

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

10.5. Sliding-Bearing Stages

Table 100. Global Motion Positioning Stages Market Size, by Sliding-Bearing Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 101. Global Motion Positioning Stages Market Size, by Sliding-Bearing Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 102. Global Motion Positioning Stages Market Size, by Sliding-Bearing Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Cost and Performance Trade-Offs for Commercially Available Linear Stages
   - Taxonomy evidence: Dovetail stages are identified as a commercial sliding-contact stage class.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
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    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
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    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
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    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
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    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.
29. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.

10.6. Mixed-Guidance Stages

Table 103. Global Motion Positioning Stages Market Size, by Mixed-Guidance Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 104. Global Motion Positioning Stages Market Size, by Mixed-Guidance Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 105. Global Motion Positioning Stages Market Size, by Mixed-Guidance Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Progress of Mechanical Design of Nanopositioning Stages at the Advanced Photon Source
   - Taxonomy evidence: The institutional manuscript describes a flexure rotation stage mounted on a bearing rotation stage, establishing a mixed-guidance architecture. The research implementation does not independently establish external commercial supply.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

10.7. Liquid-Hydrostatic-Bearing Stages

Table 106. Global Motion Positioning Stages Market Size, by Liquid-Hydrostatic-Bearing Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 107. Global Motion Positioning Stages Market Size, by Liquid-Hydrostatic-Bearing Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 108. Global Motion Positioning Stages Market Size, by Liquid-Hydrostatic-Bearing Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ABTech - Oil Hydrostatic Linear Stages
   - Taxonomy evidence: ABTech advertises oil-hydrostatic linear stages as standalone units or multi-axis assemblies, establishing an own-product complete-stage offering.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
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6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
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16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
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19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
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25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

10.8. Magnetically Levitated Stages

Table 109. Global Motion Positioning Stages Market Size, by Magnetically Levitated Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 110. Global Motion Positioning Stages Market Size, by Magnetically Levitated Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 111. Global Motion Positioning Stages Market Size, by Magnetically Levitated Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. PI - Linear Translation Stages and NanoPositioners Overview
   - Taxonomy evidence: The overview separately describes magnetic-levitation guidance. This presentation alone does not establish an external sale or distinguish every offering from a demonstrator.
2. Six Degree of Freedom Fine Motion Positioning Stage Based on Magnetic Levitation
   - Taxonomy evidence: The NASA-hosted 1994 paper describes a magnetically suspended six-degree-of-freedom positioning platform. It establishes the named technical family, not current commercial availability.
3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
8. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
10. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
30. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

11. Motion Positioning Stages Market, by Feedback Architecture

[redacted] Readout availability therefore does not establish a position-servo commitment. Buyers should distinguish the information displayed from the closed-loop behavior included in the accepted package.

Actuator-Side Closed-Loop Stages and Dual-Position-Feedback Stages should be distinguished at the configuration level. [redacted] The selected controller and feedback package must remain part of the purchasing commitment.

Integration scope is a further commercial choice. Aerotech distinguishes component-level from complete-system integration in the PRO-SV ordering documentation, allowing the buyer to retain an existing control arrangement or purchase a defined system scope. [redacted]

Figure 16. Global Motion Positioning Stages Market Size, by Feedback Architecture, 2025 (%)

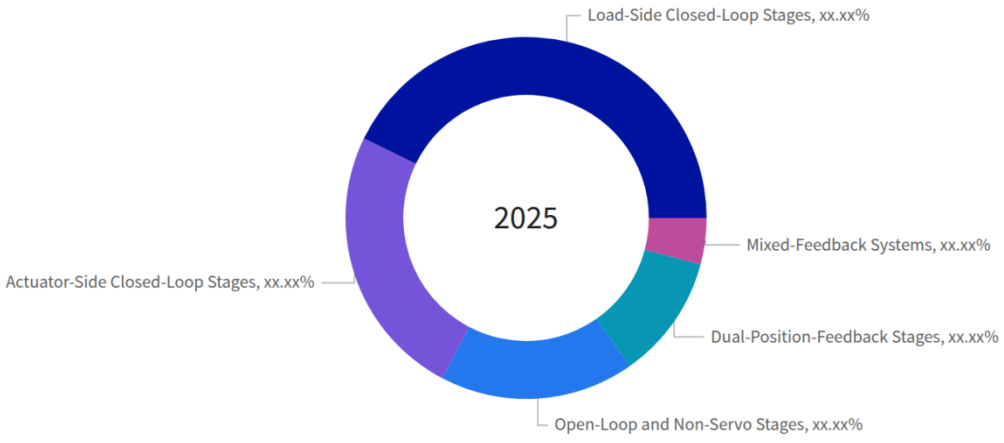


Figure 17. Global Motion Positioning Stages Market, by Feedback Architecture, 2032 (USD Million)

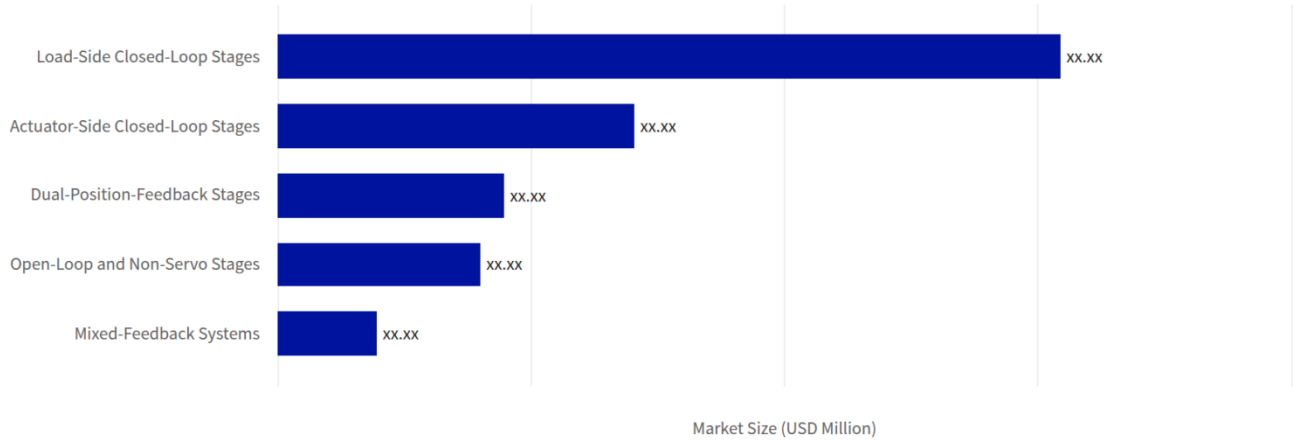


Table 112. Global Motion Positioning Stages Market, by Feedback Architecture growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 113. Global Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. X-LDQ-AE Features - Zaber
   - X-LDQ-AE includes a linear encoder and built-in controller providing pre-tuned closed-loop servo positioning; this establishes the described package, not other families' architecture.
2. Global tender for a manual waveguide alignment rig - Indian Institute of Science
   - The manual alignment procurement requires a digital position readout, supporting the distinction between readout and a position-servo commitment.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
3. F-712.Hxx Compact, High-Speed 6-DOF Photonics Alignment Systems - PI
   - F-xx.xx documents combined coarse/fine positioning. That arrangement alone does not establish different constituent position-feedback architectures.

4. PRO-SV Long-Travel Lift Stages - Aerotech
   - PRO-SV ordering options distinguish rotary-only feedback from direct-linear-plus-rotary feedback explicitly labeled dual-loop, and separately distinguish component-level from complete-system integration. These options do not establish a particular multi-axis mixed-feedback configuration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))
5. IISER Berhampur - Notice Inviting Tender IISERBpr/S&P/2024-25/06
   - Taxonomy evidence: The tip-tilt purchase requirement specifies integrated strain-gauge sensing and distinguishes closed-loop from open-loop positioning.
6. Indian Institute of Science - Tender Notification for the Procurement of 3-Axis Piezo Stage for Microscopy
   - Taxonomy evidence: The requested piezo stage is a complete positioning purchase with an integrated capacitive sensor and closed-loop travel requirements.
7. Precision Positioning Which Contains Flexible Mechanical System - Fusion of Semi-Closed and Full-Closed Loop Control
   - Taxonomy evidence: The paper distinguishes motor-angle, load-angle, and combined positioning feedback architectures.
8. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
9. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

10. SIGMAKOKI Integrated Report 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
11. MISUMI Integrated Report 2025 - Business Portfolio
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
12. Festo Sustainability Report 2025 - Festo at a Glance
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
13. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
14. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
15. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
16. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
17. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

18. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor-demand proxy uses association member billings; dual-position package prevalence and realization remain assumptions. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed demand-scale input constrains the semiconductor portion of the allocation; mixed-system attribution is not disclosed. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))

19. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))

20. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
21. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
22. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
23. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
24. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
25. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

26. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

27. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

28. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

29. X-LSQ075A Specifications - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

30. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

31. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue.
([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

32. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

11.1. Load-Side Closed-Loop Stages

Table 114. Global Motion Positioning Stages Market Size, by Load-Side Closed-Loop Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 115. Global Motion Positioning Stages Market Size, by Load-Side Closed-Loop Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 116. Global Motion Positioning Stages Market Size, by Load-Side Closed-Loop Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Precision Positioning Which Contains Flexible Mechanical System - Fusion of Semi-Closed and Full-Closed Loop Control
   - Taxonomy evidence: Full-closed positioning control is distinguished by load-angle feedback.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
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6. Festo Sustainability Report 2025 - Festo at a Glance
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
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10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
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- Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share.
([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))

13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift.
    ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

28. X-LDQ-AE Precision Linear Motor Stages - Zaber
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

29. P-737 PIFOC Specimen Z Positioners - PI
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

11.2. Actuator-Side Closed-Loop Stages

Table 117. Global Motion Positioning Stages Market Size, by Actuator-Side Closed-Loop Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 118. Global Motion Positioning Stages Market Size, by Actuator-Side Closed-Loop Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 119. Global Motion Positioning Stages Market Size, by Actuator-Side Closed-Loop Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Precision Positioning Which Contains Flexible Mechanical System - Fusion of Semi-Closed and Full-Closed Loop Control
   - Taxonomy evidence: Semi-closed positioning control is defined using motor-angle information.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
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- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
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([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))

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- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))

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19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales.
    ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
29. PRO-SV Long-Travel Lift Stages - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))
30. P-737 PIFOC Specimen Z Positioners - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

11.3. Open-Loop and Non-Servo Stages

Table 120. Global Motion Positioning Stages Market Size, by Open-Loop and Non-Servo Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 121. Global Motion Positioning Stages Market Size, by Open-Loop and Non-Servo Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 122. Global Motion Positioning Stages Market Size, by Open-Loop and Non-Servo Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IISER Berhampur - Notice Inviting Tender IISERBpr/S&P/2024-25/06
   - Taxonomy evidence: The tip-tilt specification distinguishes open-loop and closed-loop performance, while the manual-stage line items establish non-servo positioning purchases.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue.
([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))

13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))

14. World Robotics 2025 Industrial Robots - Executive Summary
- Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
- Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
- Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
- Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.

15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
- Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
- Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.

17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
- Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
- Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.

19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
- Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.

· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases.
([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.

· Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
29. X-LSQ075A Specifications - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

11.4. Dual-Position-Feedback Stages

Table 123. Global Motion Positioning Stages Market Size, by Dual-Position-Feedback Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 124. Global Motion Positioning Stages Market Size, by Dual-Position-Feedback Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 125. Global Motion Positioning Stages Market Size, by Dual-Position-Feedback Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Precision Positioning Which Contains Flexible Mechanical System - Fusion of Semi-Closed and Full-Closed Loop Control
   - Taxonomy evidence: The study combines motor-side and load-side position information; it establishes an engineering architecture, not a marketed complete-stage transaction.
2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
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10. Novanta Announces Agreement to Acquire Motion Solutions
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11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
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- Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
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- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor-demand proxy uses association member billings; dual-position package prevalence and realization remain assumptions.
([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))

13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))

14. World Robotics 2025 Industrial Robots - Executive Summary
- Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
- Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
- Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
- Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.

15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
- Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
- Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.

17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
- Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
- Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.

19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
- Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption.
    ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. X-LDQ-AE Precision Linear Motor Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote.
      ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote.
      ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
29. PRO-SV Long-Travel Lift Stages - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights.
      ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights.
      ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

11.5. Mixed-Feedback Systems

Table 126. Global Motion Positioning Stages Market Size, by Mixed-Feedback Systems, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 127. Global Motion Positioning Stages Market Size, by Mixed-Feedback Systems, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 128. Global Motion Positioning Stages Market Size, by Mixed-Feedback Systems, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

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- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
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- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed demand-scale input constrains the semiconductor portion of the allocation; mixed-system attribution is not disclosed.

([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.

([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
19. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

25. Locations and Contact - Zaber

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

27. X-LDQ-AE Precision Linear Motor Stages - Zaber

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

28. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

29. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

12. Motion Positioning Stages Market, by Application

Alignment & Coupling supports both manual and automated purchasing routes. The Indian Institute of Science's 2022 manual waveguide-alignment tender required compatible stages and holders together with after-sales support in India. ▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ Buyers should request the documentation appropriate to the task being purchased.

▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

An equipment builder needs agreement on the stage's role in the larger assembly, while a facility operator evaluating replacement must confirm compatibility with its retained instrument and service arrangement. Suppliers should contract for the identifiable stage and associated responsibilities rather than presume responsibility for the entire processing machine, assembly station, or analytical instrument.

Figure 18. Global Motion Positioning Stages Market Size, by Application, 2025 (%)

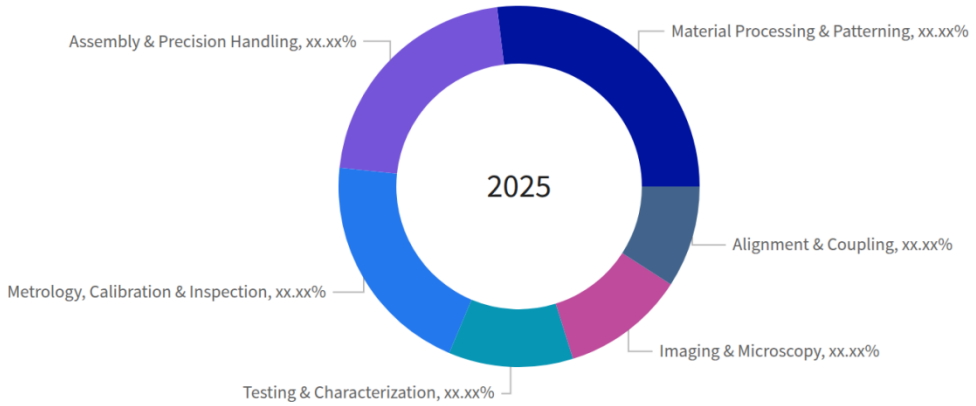


Figure 19. Global Motion Positioning Stages Market, by Application, 2032 (USD Million)

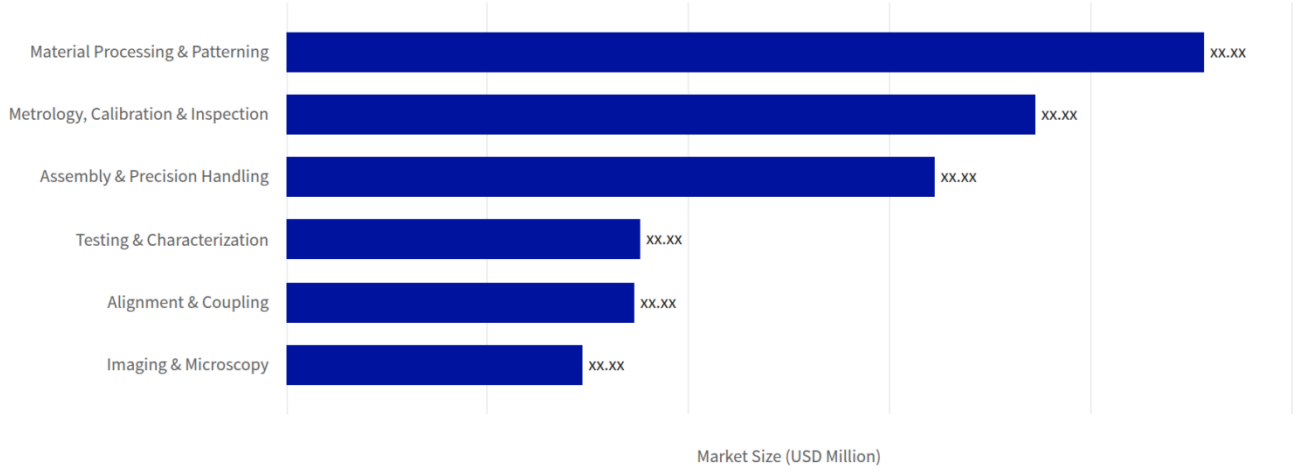


Table 129. Global Motion Positioning Stages Market, by Application growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 130. Global Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   - ASR advertises Nucleus microscopy modules, µManager support, and mounting options for popular microscopes; these establish advertised compatibility, not buyer acceptance.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.

2. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
   - PI positions H-xx.xx for photonics and precision assembly; the application description does not establish a customer purchase or complete assembly-station responsibility.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
3. Global tender for a manual waveguide alignment rig - Indian Institute of Science
   - The tender requires compatible stages and accessories and after-sales service, support, and repair through the vendor or its associate in India; it is not an award record.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
4. F-712.Hxx Compact, High-Speed 6-DOF Photonics Alignment Systems - PI
   - PI describes integrated alignment routines and software support for F-xx.xx establishing an automated offering rather than independently verified customer outcomes.
5. Dimensional nano and sub nanometrology - National Physical Laboratory
   - NPL describes traceable displacement measurement, stage metrology, and investigation of high-precision scanning-stage errors. This supports distinguishing metrological documentation from imaging-software compatibility.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
6. Tenders Archive - Indian Institute of Technology Delhi
   - IIT Delhi's official archive records the August xx.xx 2024 advertisement for a multiaxes precision CNC stage for a femtosecond laser micromachining system. The archive establishes a procurement advertisement, not an award.
7. Facility Equipment - MIRIAM/B22 - Diamond Light Source
   - Diamond Light Source's B22 facility page lists operational sample-positioning stages within infrared imaging and microspectroscopy end stations, establishing an institutional characterization-use context rather than a new procurement.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.

8. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
9. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
10. SIGMAKOKI Integrated Report 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
11. MISUMI Integrated Report 2025 - Business Portfolio
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
12. Festo Sustainability Report 2025 - Festo at a Glance
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
13. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
14. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
15. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
16. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

17. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
18. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported USD xx.xx of 2025 semiconductor-equipment billings anchors the shared semiconductor activity pool, not alignment-stage sales directly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor activity denominator used with an explicitly assumed dedicated-imaging stage-content rate.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the semiconductor pool scale; metrology-specific revenue attribution remains modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports semiconductor equipment demand without substituting complete-equipment value for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Provides the common equipment-activity anchor for the modeled assembly and handling contribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports strong test-equipment growth, supporting a distinct testing demand context rather than observed stage shipments.
19. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity is a purchasing proxy, not material-processing stage shipments.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity is a purchasing proxy, not material-processing stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 installation benchmark and forecast of xx.xx installations in 2029 constrain the handling-demand scenario without establishing stage attachment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 installation benchmark and forecast of xx.xx installations in 2029 constrain the handling-demand scenario without establishing stage attachment.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the shared industrial activity pool from which functional-testing package demand is modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the shared industrial activity pool from which functional-testing package demand is modeled.

20. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
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    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
21. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
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    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
23. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
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    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
25. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
26. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies approximately JPY xx.xx investment and planned doubling of automated-stage supply capacity; it supports a conditional adoption premise, not realized revenue.

27. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
28. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
29. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.

30. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
31. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
32. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.
33. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.

12.1. Material Processing & Patterning

Table 131. Global Motion Positioning Stages Market Size, by Material Processing & Patterning, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 132. Global Motion Positioning Stages Market Size, by Material Processing & Patterning, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 133. Global Motion Positioning Stages Market Size, by Material Processing & Patterning, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Delhi - Multiaxes Precision CNC Stage for Femtosecond Laser Micromachining System

   · Taxonomy evidence: The institutional tender specifies supply and integration of a complete positioning-stage system for laser micromachining and expressly excludes the laser source and beam-delivery system. This directly supports stage-attributable material-processing demand rather than whole-machine revenue. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports semiconductor equipment demand without substituting complete-equipment value for stage revenue.

13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity is a purchasing proxy, not material-processing stage shipments.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity is a purchasing proxy, not material-processing stage shipments.
14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
29. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
30. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
31. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.
32. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.

12.2. Assembly & Precision Handling

Table 134. Global Motion Positioning Stages Market Size, by Assembly & Precision Handling, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 135. Global Motion Positioning Stages Market Size, by Assembly & Precision Handling, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 136. Global Motion Positioning Stages Market Size, by Assembly & Precision Handling, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Multi-Probe Micro-Assembly

   · Taxonomy evidence: The 2007 institutional study identifies commercial nanopositioning stages within microassembly equipment. It establishes assembly and manipulation as stage-use categories, not a newly commercialized stage product, present deployment prevalence, or 2025 sales. ([tsapps.nist.gov](https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=xx.xx))

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
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10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
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12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Provides the common equipment-activity anchor for the modeled assembly and handling contribution.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 installation benchmark and forecast of xx.xx installations in 2029 constrain the handling-demand scenario without establishing stage attachment.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 installation benchmark and forecast of xx.xx installations in 2029 constrain the handling-demand scenario without establishing stage attachment.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
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    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
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19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. LSM Family - Compact, Screw Drive Linear Stage - Zaber
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
29. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
30. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
31. H-811.I2 · H-811.I2HS Miniature Hexapod - Physik Instrumente
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.

12.3. Metrology, Calibration & Inspection

Table 137. Global Motion Positioning Stages Market Size, by Metrology, Calibration & Inspection, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 138. Global Motion Positioning Stages Market Size, by Metrology, Calibration & Inspection, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 139. Global Motion Positioning Stages Market Size, by Metrology, Calibration & Inspection, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Dimensional nano and sub nanometrology

   · Taxonomy evidence: The national metrology institution describes stage metrology and high-precision scanning stages used in metrological atomic force microscopy, establishing a dimensional-metrology use distinct from image acquisition alone. ([npl.co.uk](https://www.npl.co.uk/research/dimensional/nano-and-sub-nanometrology))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

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    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

28. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
29. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.

12.4. Testing & Characterization

Table 140. Global Motion Positioning Stages Market Size, by Testing & Characterization, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 141. Global Motion Positioning Stages Market Size, by Testing & Characterization, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 142. Global Motion Positioning Stages Market Size, by Testing & Characterization, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Facility Equipment - MIRIAM/B22

   · Taxonomy evidence: The operational infrared imaging and microspectroscopy facility lists sample-positioning stages in its analytical end stations. This establishes stage-enabled analytical characterization, while the complete instruments and facility value remain outside stage revenue. ([diamond.ac.uk](https://www.diamond.ac.uk/Instruments/Soft-Condensed-Matter/B22/status.html))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports strong test-equipment growth, supporting a distinct testing demand context rather than observed stage shipments.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the shared industrial activity pool from which functional-testing package demand is modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the shared industrial activity pool from which functional-testing package demand is modeled.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
29. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.

12.5. Imaging & Microscopy

Table 143. Global Motion Positioning Stages Market Size, by Imaging & Microscopy, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 144. Global Motion Positioning Stages Market Size, by Imaging & Microscopy, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 145. Global Motion Positioning Stages Market Size, by Imaging & Microscopy, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. JPL Robotics: The Computer Vision Laboratory

   · Taxonomy evidence: The institutional facility description identifies an optical bench with translation stages used to acquire image sequences with controlled camera or object motion. It establishes imaging use, without establishing a stage purchase date, merchant-stage value, or deployment volume. ([robotics.jpl.nasa.gov](https://robotics.jpl.nasa.gov/how-we-do-it/facilities/the-computer-vision-laboratory/))

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
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9. Aerotech Recruiting FAQs
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10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor activity denominator used with an explicitly assumed dedicated-imaging stage-content rate.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
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    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
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15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
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16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
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    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

28. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
29. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
30. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.

12.6. Alignment & Coupling

Table 146. Global Motion Positioning Stages Market Size, by Alignment & Coupling, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 147. Global Motion Positioning Stages Market Size, by Alignment & Coupling, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 148. Global Motion Positioning Stages Market Size, by Alignment & Coupling, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Global tender for a manual waveguide alignment rig

   · Taxonomy evidence: The October xx.xx 2022 institutional tender requests an integrated manual waveguide-alignment assembly containing input, central, and output positioning stages for optical coupling. This establishes an alignment-stage procurement category, not an award or realized sale. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.

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    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies approximately JPY xx.xx investment and planned doubling of automated-stage supply capacity; it supports a conditional adoption premise, not realized revenue.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. LSM Family - Compact, Screw Drive Linear Stage - Zaber
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
29. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.

13. Motion Positioning Stages Market, by End-User Sector

[redacted] Research & Technical Services has a different documented commercial context: NPL describes stage metrology and displacement-measurement work. Suppliers addressing that activity should establish the required measurement documentation rather than assume that an industrial equipment specification answers the purchasing need.

[redacted] For comparable institutional opportunities, the commercial commitment extends beyond delivering the assembly. These are requirements of that procurement, not universal university purchasing rules or proof of a completed delivery.

Within Healthcare Services, microscopy compatibility must be separated from provider purchasing and application acceptance. [redacted] Zaber states that its products are neither designed nor intended for military or law-enforcement applications; that supplier-specific position should be checked before pursuing such an account, without generalizing it to other manufacturers.

[redacted] The complete instrument offering does not establish a separate utility-stage contract. Account development should follow that purchasing relationship rather than assume that every instrument operator is an accessible standalone-stage buyer.

Figure 20. Global Motion Positioning Stages Market Size, by End-User Sector, 2025 (%)

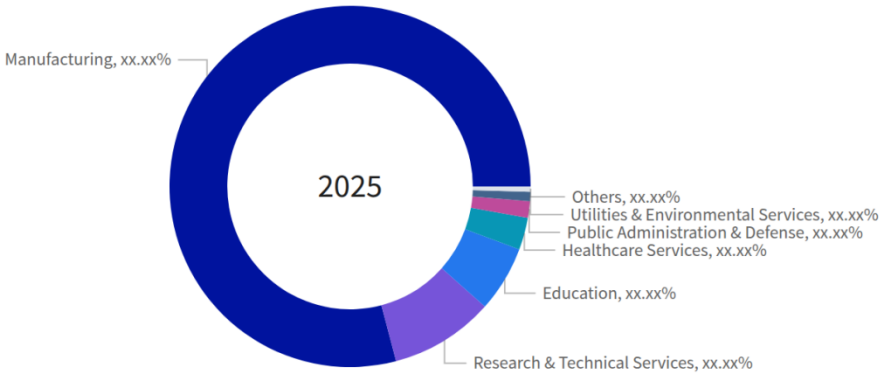


Figure 21. Global Motion Positioning Stages Market, by End-User Sector, 2032 (USD Million)

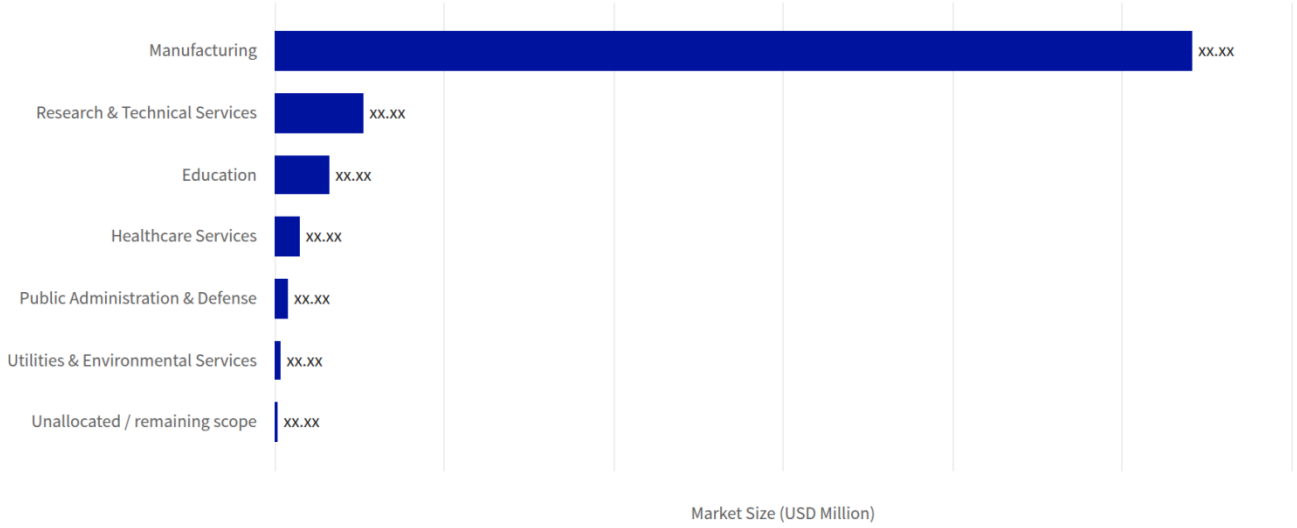


Table 149. Global Motion Positioning Stages Market, by End-User Sector growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 150. Global Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber

   · ASR advertises microscopy software support. That offering statement does not establish healthcare-provider purchasing or application acceptance. ([zaber.com](https://www.zaber.com/products/families/ASR))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

2. Orders, Shipping & Warranties

   · Zaber states that its products are neither designed nor intended for military or law-enforcement applications. This is a supplier-specific application policy. ([zaber.com](https://www.zaber.com/ordering))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

3. Dimensional nano and sub nanometrology - National Physical Laboratory

   · NPL describes displacement measurement and stage metrology within its research activities, supporting a research-and-technical-services context without establishing a stage purchase. ([npl.co.uk](https://www.npl.co.uk/research/dimensional/nano-and-sub-nanometrology))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.

4. Automating Precision Assembly with the SmartStage XY
   - Dover Motion describes SmartStage XY selection for Cellerate equipment and positions the equipment across research and production quality-control settings; this does not identify every eventual operator. ([dovermotion.com](https://dovermotion.com/case-studies/automating-precision-assembly-with-the-smartstage-xy/))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
5. UNSD Classification Detail - ISIC Rev.4, Section O: Public administration and defence; compulsory social security
   - The United Nations classification states that institutional status alone does not determine public-administration classification and explicitly assigns military hospitals to healthcare. It establishes classification boundaries, not stage adoption. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/O))
   - Taxonomy evidence: The official classification states that institutional or legal status alone does not determine public-administration classification: publicly operated activities classified elsewhere remain in their respective sectors. This supports activity-based end-user allocation rather than assigning every public buyer to government. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/O))
6. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
   - IISc's September 2023 linear-stage RFQ identifies its own department as the destination and requires support, spares and installation acceptance. It is an invitation, not delivery evidence. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
7. AlgaPro AI-Powered Phytoplankton Monitoring
   - AGS Scientific markets AlgaPro TE300 for water-monitoring applications, identifies an incorporated motorized stage, and offers installation and continuing support. The page does not establish a separate utility-stage contract. ([agssci.com](https://agssci.com/product/algapro-te300/))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.

8. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
9. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
10. SIGMAKOKI Integrated Report 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
11. MISUMI Integrated Report 2025 - Business Portfolio
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
12. Festo Sustainability Report 2025 - Festo at a Glance
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
13. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
14. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

15. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
16. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
17. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
18. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported global 2025 semiconductor-equipment sales of USD xx.xx anchor the semiconductor-related activity pool; merchant-stage content and Manufacturing attribution are modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported global 2025 semiconductor-equipment sales of USD xx.xx anchor the semiconductor-related activity pool; merchant-stage content and Manufacturing attribution are modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment total initializes the shared semiconductor pool; research-establishment routing is an explicit assumption, not a reported customer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment total initializes the shared semiconductor pool; research-establishment routing is an explicit assumption, not a reported customer share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment total initializes the shared semiconductor pool; academic-facility routing is modeled rather than observed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment total initializes the shared semiconductor pool; academic-facility routing is modeled rather than observed.

19. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 provide the observed industrial-activity benchmark, not stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 provide the observed industrial-activity benchmark, not stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; technical-service attribution remains modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; technical-service attribution remains modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; educational attribution remains modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; educational attribution remains modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; healthcare attribution remains modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; healthcare attribution remains modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; public-sector attribution remains modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; public-sector attribution remains modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; utility attribution remains modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; utility attribution remains modeled.

20. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
21. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
22. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
23. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

24. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
25. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
26. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
27. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
28. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

29. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.

13.1. Manufacturing

Table 151. Global Motion Positioning Stages Market Size, by Manufacturing, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 152. Global Motion Positioning Stages Market Size, by Manufacturing, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 153. Global Motion Positioning Stages Market Size, by Manufacturing, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. UNSD Classification Detail - ISIC Rev.4, Section C: Manufacturing

   · Taxonomy evidence: The official manufacturing section encompasses physical or chemical transformation and assembly of manufactured products. Its listed divisions include electronic and optical products, electrical equipment, machinery, transportation equipment, chemicals, and pharmaceuticals. This supports sector definition only, not stage adoption or sales.
   ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/C))

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.

3. MKS Inc. Annual Report 2025

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.

5. MISUMI Integrated Report 2025 - Business Portfolio

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.

6. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported global 2025 semiconductor-equipment sales of USD xx.xx anchor the semiconductor-related activity pool; merchant-stage content and Manufacturing attribution are modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported global 2025 semiconductor-equipment sales of USD xx.xx anchor the semiconductor-related activity pool; merchant-stage content and Manufacturing attribution are modeled.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 provide the observed industrial-activity benchmark, not stage shipments.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 provide the observed industrial-activity benchmark, not stage shipments.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
29. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.

13.2. Research & Technical Services

Table 154. Global Motion Positioning Stages Market Size, by Research & Technical Services, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 155. Global Motion Positioning Stages Market Size, by Research & Technical Services, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 156. Global Motion Positioning Stages Market Size, by Research & Technical Services, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Dimensional nano and sub nanometrology

   · Taxonomy evidence: The page documents an institution performing research and measurement activities involving positioning stages. This supports research-and-technical-service use, but not a particular establishment code, procurement amount, or sector share. ([npl.co.uk](https://www.npl.co.uk/research/dimensional/nano-and-sub-nanometrology))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.

2. Facility Equipment - MIRIAM/B22

   · Taxonomy evidence: The facility's own equipment inventory provides operator-side evidence of positioning-stage use in a dedicated scientific setting. It does not disclose a separate stage transaction or establish an official establishment classification. ([diamond.ac.uk](https://www.diamond.ac.uk/Instruments/Soft-Condensed-Matter/B22/status.html))

3. UNSD Classification Detail - ISIC Rev.4, Division 72: Scientific research and development

· Taxonomy evidence: The official scientific-R&D division distinguishes research and development activities as an economic activity, supporting classification of dedicated research establishments separately from their funding source or research subject. It does not establish stage purchasing. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/xx.xx))

4. UNSD Classification Detail - ISIC Rev.4, Division 71: Architectural and engineering activities; technical testing and analysis

· Taxonomy evidence: The official classification identifies engineering services and technical testing and analysis as economic activities. This supports the technical-service portion of the combined sector without treating every internal industrial laboratory as an independent service establishment. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/xx.xx))

5. Positioning 2026 Business Report - HOERBIGER

· Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.

6. MKS Inc. Annual Report 2025

· Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

7. SIGMAKOKI Integrated Report 2025

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.

8. MISUMI Integrated Report 2025 - Business Portfolio

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.

9. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
10. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
11. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
12. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
13. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
14. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

15. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment total initializes the shared semiconductor pool; research-establishment routing is an explicit assumption, not a reported customer share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment total initializes the shared semiconductor pool; research-establishment routing is an explicit assumption, not a reported customer share.
16. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; technical-service attribution remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; technical-service attribution remains modeled.

17. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
18. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
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    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
20. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
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21. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
22. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.

23. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
24. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
25. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

27. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
28. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
29. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
30. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
31. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
32. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
33. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.

13.3. Education

Table 157. Global Motion Positioning Stages Market Size, by Education, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 158. Global Motion Positioning Stages Market Size, by Education, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 159. Global Motion Positioning Stages Market Size, by Education, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Delhi - Multiaxes Precision CNC Stage for Femtosecond Laser Micromachining System
   · Taxonomy evidence: The specified installation and institutional-use destination establish an educational purchaser and intended operator; the tender does not prove completed delivery. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))
2. Global tender for a manual waveguide alignment rig
   · Taxonomy evidence: The procurement is issued by an educational institution for its own optics work, providing buyer-side evidence relevant to Education rather than inferring the buyer sector from a supplier's customer list. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))

3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.

21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
30. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
31. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.

32. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
33. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.

13.4. Healthcare Services

Table 160. Global Motion Positioning Stages Market Size, by Healthcare Services, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 161. Global Motion Positioning Stages Market Size, by Healthcare Services, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 162. Global Motion Positioning Stages Market Size, by Healthcare Services, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. UNSD Classification Detail - ISIC Rev.4, Division 86: Human health activities

   · Taxonomy evidence: The official human-health division defines healthcare-service activities, including hospitals and medical practices. This supplies a sector boundary but does not establish eligible stage procurement, regulatory authorization of a stage, or current healthcare adoption. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/xx.xx))

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; healthcare attribution remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; healthcare attribution remains modeled.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

28. ASR Family - Motorized XY Microscope Stages - Zaber
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

29. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.

13.5. Public Administration & Defense

Table 163. Global Motion Positioning Stages Market Size, by Public Administration & Defense, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 164. Global Motion Positioning Stages Market Size, by Public Administration & Defense, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 165. Global Motion Positioning Stages Market Size, by Public Administration & Defense, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. UNSD Classification Detail - ISIC Rev.4, Section O: Public administration and defence; compulsory social security

   · Taxonomy evidence: The section includes public administration, national defense, and public-order functions, while distinguishing teaching and healthcare activities. This establishes the proposed sector boundary, not a verified stage purchase by that sector. ([unstats.un.org](https://unstats.un.org/unsd/classifications/Econ/Detail/EN/xx.xx/O))

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
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11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
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12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; public-sector attribution remains modeled.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The installation benchmark initializes the industrial pool; public-sector attribution remains modeled.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
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    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
29. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

13.6. Utilities & Environmental Services

Table 166. Global Motion Positioning Stages Market Size, by Utilities & Environmental Services, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 167. Global Motion Positioning Stages Market Size, by Utilities & Environmental Services, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 168. Global Motion Positioning Stages Market Size, by Utilities & Environmental Services, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

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19. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
25. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
27. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.

14. Motion Positioning Stages Market, by Purchasing Role

Purchasing Role distinguishes stage incorporation, integration services and ownership of the operating asset. ■■■ ■■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■ ■■■■■ ■■■ ■■■■■■■■■■■■■ ■■■■ ■ ■■■■■■ ■■■■■■■ ■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ An OEM agreement should identify the accepted stage package and responsibility for subsequent changes; incorporation alone does not transfer accountability for the complete equipment to the stage manufacturer.

Independent System Integrators may influence selection without issuing the stage purchase order. KAP Consulting advertises positioning-stage integration, machine retrofits and assistance to equipment builders. ■■■■ ■■■■■■■■■■■ ■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■ ■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■ ■■■■■ ■■ ■■■■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■ ■ ■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■ ■■ ■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■ ■ ■■■■■■■■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■■■

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Figure 22. Global Motion Positioning Stages Market Size, by Purchasing Role, 2025 (%)

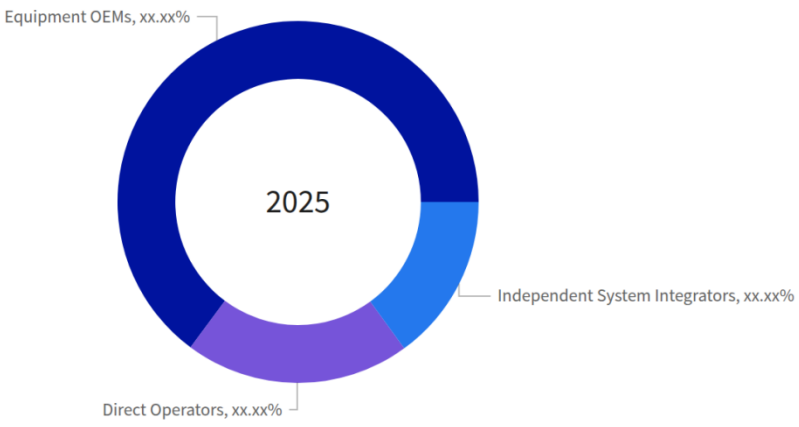


Figure 23. Global Motion Positioning Stages Market, by Purchasing Role, 2032 (USD Million)

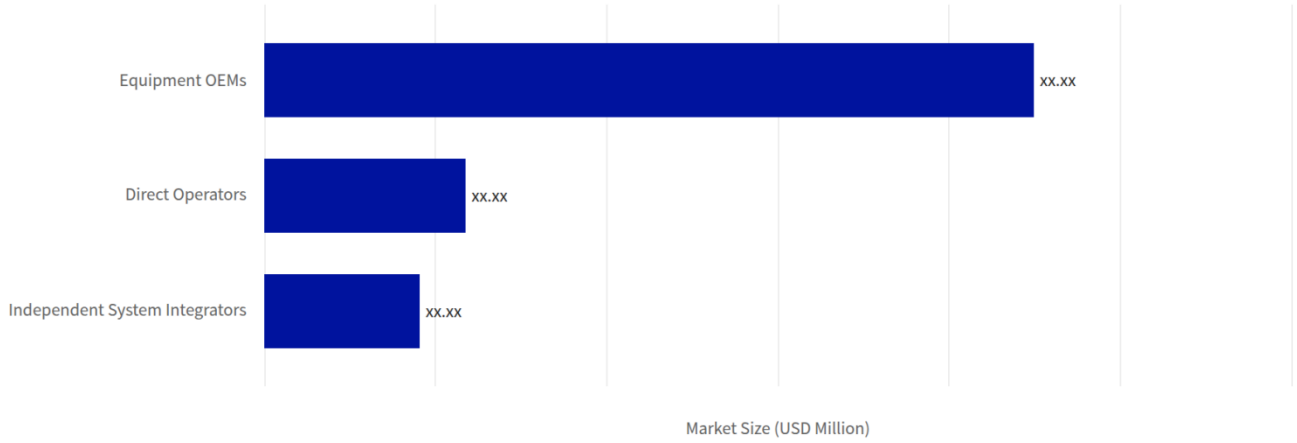


Table 169. Global Motion Positioning Stages Market, by Purchasing Role growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 170. Global Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Automating Precision Assembly with the SmartStage XY

   · The case documents stage incorporation into Cellerate's larger module, supporting an Equipment OEM sourcing relationship rather than complete-equipment responsibility by the stage supplier. ([dovermotion.com](https://dovermotion.com/case-studies/automating-precision-assembly-with-the-smartstage-xy/))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

2. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
   - The RFQ permits manufacturer or authorized-distributor responses and purchases supplier installation for an institution-owned stage, separating operator role from channel and integration scope. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
3. KAP Consulting - Automation and Controls Integration & Programming
   - KAP Consulting advertises positioning-stage integration, machine retrofits and assistance to equipment builders. Its service description does not establish complete-stage procurement on every project. ([kapconsultingllc.com](https://kapconsultingllc.com/automation.html))
4. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
5. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
6. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
7. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
8. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
9. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.

10. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
11. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
12. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
13. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
14. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 semiconductor-equipment sales of USD xx.xx anchor the semiconductor activity pool; assumed merchant-stage content and OEM routing are separate model inputs.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains the value weight receiving the assumed integrator fraction; equipment sales do not measure integrator stage purchases.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same semiconductor activity anchor constrains the cohort receiving the assumed operator fraction, without equating equipment buyers with stage buyers.
15. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 anchor industrial activity; stage attachment, realization and purchasing-role fractions remain assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity constrains the industrial-stage pool allocated partly to integrator procurement, not integration-service revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity constrains the industrial pool allocated partly to own-use purchasing; it is not a direct stage-shipment count.

16. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
17. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
18. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
19. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
20. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
21. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
22. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-stage supply capacity for manufacturing equipment. It supports an incorporation-demand premise, not realized sales or purchasing-role percentages.

23. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

24. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.

25. Novanta Inc. - 2024 Annual Report
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.

26. KAP Consulting - Motion Control Sales & Integration
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

27. Locations and Contact - Zaber
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.

14.1. Equipment OEMs

Table 171. Global Motion Positioning Stages Market Size, by Equipment OEMs, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 172. Global Motion Positioning Stages Market Size, by Equipment OEMs, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 173. Global Motion Positioning Stages Market Size, by Equipment OEMs, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Berkeley Lights, Inc. - 2022 Annual Report

   · Taxonomy evidence: The 2022 annual report identifies motion stages among third-party-supplied components used to manufacture the company's systems. This is buyer-side evidence of equipment-manufacturer incorporation; it does not establish the ultimate operating sector of its customers or purchases in 2025.
   ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/phenomexfkaberkeleylights_.pdf))

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reported 2025 semiconductor-equipment sales of USD xx.xx anchor the semiconductor activity pool; assumed merchant-stage content and OEM routing are separate model inputs.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 anchor industrial activity; stage attachment, realization and purchasing-role fractions remain assumptions.

14. World Robotics 2025 Industrial Robots - Executive Summary
- Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
- Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
- Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
- Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.

15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
- Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
- Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
- Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.

17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
- Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
- Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.

19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
- Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-stage supply capacity for manufacturing equipment. It supports an incorporation-demand premise, not realized sales or purchasing-role percentages.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
29. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.
30. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.

14.2. Direct Operators

Table 174. Global Motion Positioning Stages Market Size, by Direct Operators, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 175. Global Motion Positioning Stages Market Size, by Direct Operators, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 176. Global Motion Positioning Stages Market Size, by Direct Operators, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Delhi - Multiaxes Precision CNC Stage for Femtosecond Laser Micromachining System

   · Taxonomy evidence: The institution seeks a stage for integration into equipment at its own site. This demonstrates direct-operator procurement even though the supply contract includes integration responsibilities. OEMs and authorized dealers mentioned as bidders are suppliers, not the buyer role. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity constrains the industrial pool allocated partly to own-use purchasing; it is not a direct stage-shipment count.

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    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
29. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.

14.3. Independent System Integrators

Table 177. Global Motion Positioning Stages Market Size, by Independent System Integrators, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 178. Global Motion Positioning Stages Market Size, by Independent System Integrators, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 179. Global Motion Positioning Stages Market Size, by Independent System Integrators, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. KAP Consulting - Automation and Controls Integration & Programming

   · Taxonomy evidence: The business identifies itself as a system integrator and describes positioning-stage integration, customer-machine retrofits, and support for equipment builders. This supports a distinct integration role but does not demonstrate that it purchases complete stages or establish transaction volumes. ([kapconsultingllc.com](https://kapconsultingllc.com/automation.html))

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains the value weight receiving the assumed integrator fraction; equipment sales do not measure integrator stage purchases.

13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity constrains the industrial-stage pool allocated partly to integrator procurement, not integration-service revenue.
14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
29. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

15. Motion Positioning Stages Market, by Control Integration

[illegible] This can consolidate the stage-control package, but an OEM already committed to another control platform may prefer to retain that responsibility. Included control should be compared with the buyer's accepted architecture, not treated as an automatic advantage or complete-equipment commitment.

External Control Electronics remains a distinct supply arrangement. Jefferson Lab's May 2025 equipment record distinguishes Thorlabs linear stages with integrated controllers from rotary stages requiring a separate benchtop controller. [illegible]

Stages Without Control Electronics preserve a different purchasing boundary. [illegible] A less integrated package preserves architectural choice but leaves more integration responsibility with the buyer.

Figure 24. Global Motion Positioning Stages Market Size, by Control Integration, 2025 (%)

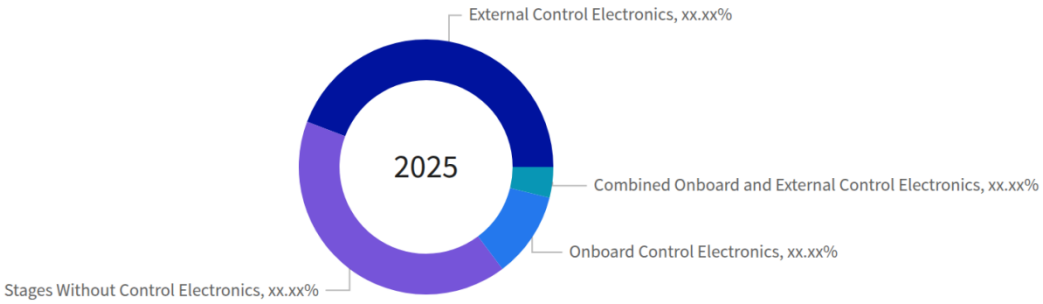


Figure 25. Global Motion Positioning Stages Market, by Control Integration, 2032 (USD Million)

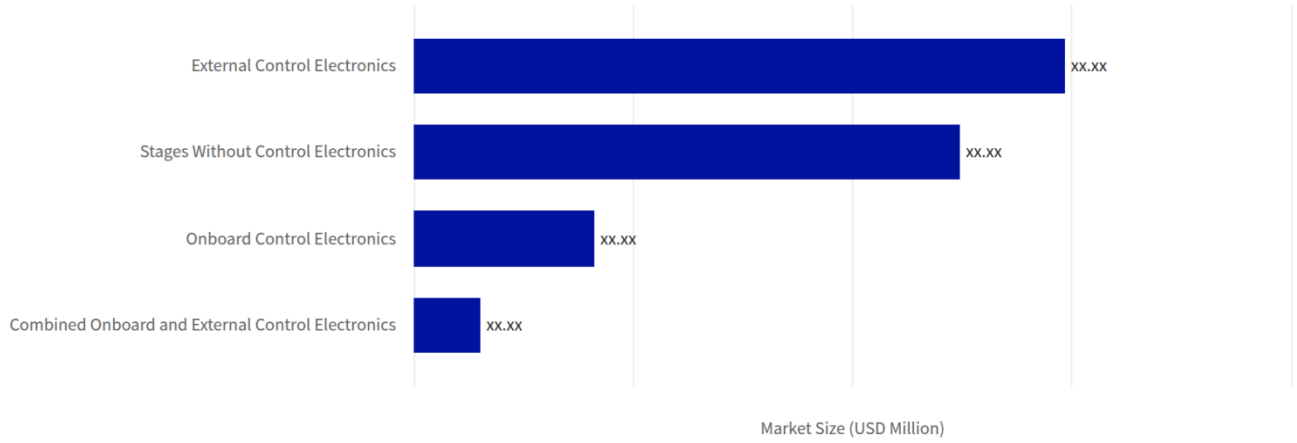


Table 180. Global Motion Positioning Stages Market, by Control Integration growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 181. Global Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber

   · The ASR family offers built-in-controller and motor-only models, supporting different control-supply boundaries while leaving selected bill-of-material exclusions to confirmation. ([zaber.com](https://www.zaber.com/products/families/ASR))

2. X-LDQ-AE Features - Zaber

   · X-LDQ-AE includes a built-in controller and linear encoder and provides computer interfaces. Computer connectivity alone does not establish a separately supplied external motion controller. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE/features))

3. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program

   · Jefferson Lab's May xx.xx 2025 record identifies integrated-controller Thorlabs linear stages and rotary stages requiring a separate benchtop controller within one installation. This establishes mixed equipment packaging, not a single combined-control stage sale. ([jlab.org](https://www.jlab.org/sites/default/files/dsg/notes/2025-xx.xx.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.

4. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

   · Taxonomy evidence: The March xx.xx 2024 procurement separately identifies stages with built-in controllers, a joystick, a power supply, and accessories, supporting distinction between stage-control packaging and ancillary equipment. ([tifr.res.in](https://www.tifr.res.in/maincampus/viewNoticeFile.php?f=VTNVU21UaFBybGJuRDJwakJmdXdVUT09&s=WFdXaTkwL1ZDTGdxaHp6eHA1bkh1QT09))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

5. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1

   · Taxonomy evidence: The September xx.xx 2023 RFQ requires a compatible controller and power supply with the high-precision linear stage. It establishes control-inclusive supply, but does not explicitly establish controller housing location. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))

6. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

7. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
8. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
9. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
11. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
13. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
14. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
15. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

16. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
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17. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
18. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
19. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
20. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
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    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
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    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
23. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

24. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
25. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
26. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
27. X-ASR-E XY Closed-Loop Scanning Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
28. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.

29. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
30. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
31. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
32. Simplified Motion Series - Festo USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

15.1. External Control Electronics

Table 182. Global Motion Positioning Stages Market Size, by External Control Electronics, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 183. Global Motion Positioning Stages Market Size, by External Control Electronics, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 184. Global Motion Positioning Stages Market Size, by External Control Electronics, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. IIT Delhi - Multiaxes Precision CNC Stage for Femtosecond Laser Micromachining System

   · Taxonomy evidence: The same procurement requires a control panel separate from the CNC stages and places all automation components except motors, including servo drives and the controller, in that panel. This establishes expressly external control-electronics packaging for the requested stage system. ([home.iitd.ac.in](https://home.iitd.ac.in/public/storage/tenders_archives/4720_1722505635.pdf))

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
29. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
30. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.

15.2. Stages Without Control Electronics

Table 185. Global Motion Positioning Stages Market Size, by Stages Without Control Electronics, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 186. Global Motion Positioning Stages Market Size, by Stages Without Control Electronics, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 187. Global Motion Positioning Stages Market Size, by Stages Without Control Electronics, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
3. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
4. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
5. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
6. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

8. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
19. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

25. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
27. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
28. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.

15.3. Onboard Control Electronics

Table 188. Global Motion Positioning Stages Market Size, by Onboard Control Electronics, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 189. Global Motion Positioning Stages Market Size, by Onboard Control Electronics, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 190. Global Motion Positioning Stages Market Size, by Onboard Control Electronics, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

   · Taxonomy evidence: The buyer explicitly requests motorized rotation and linear stages with built-in controllers and a vertical stage with an integrated controller. ([tifr.res.in](https://www.tifr.res.in/maincampus/viewNoticeFile.php?f=VTNVU21UaFBybGJuRDJwakJmdXdVUT09&s=WFdXaTkwL1ZDTGdxaHp6eHA1bkh1QT09))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

2. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

3. MKS Inc. Annual Report 2025

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

4. SIGMAKOKI Integrated Report 2025

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.

5. MISUMI Integrated Report 2025 - Business Portfolio

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.

6. Festo Sustainability Report 2025 - Festo at a Glance

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.

7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

29. X-ASR-E XY Closed-Loop Scanning Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
30. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
31. Simplified Motion Series - Festo USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

15.4. Combined Onboard and External Control Electronics

Table 191. Global Motion Positioning Stages Market Size, by Combined Onboard and External Control Electronics, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 192. Global Motion Positioning Stages Market Size, by Combined Onboard and External Control Electronics, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 193. Global Motion Positioning Stages Market Size, by Combined Onboard and External Control Electronics, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
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3. SIGMAKOKI Integrated Report 2025
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21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

25. Locations and Contact - Zaber

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

27. X-MCC Multi-axis Universal Motor Controller - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.

28. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.

29. RCP6 Next-generation ROBO Cylinder - IAI America

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

30. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

16. Motion Positioning Stages Market, by Customization Level

Customization Level changes the engineering work being purchased rather than establishing an automatic quality hierarchy. Aerotech's buying guide distinguishes Standard Catalog Stages from Configured-to-Order Stages assembled from predefined options, illustrating the latter with PlanarDL. ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪

The object being customized matters. Zaber's published gimbal example combines RST rotary stages, an external controller and custom-sized brackets. ▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪

Selection reversibility also differs. Zaber provides a standard-product satisfaction guarantee but treats guarantees for nonstandard custom products case by case. ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪

Figure 26. Global Motion Positioning Stages Market Size, by Customization Level, 2025 (%)

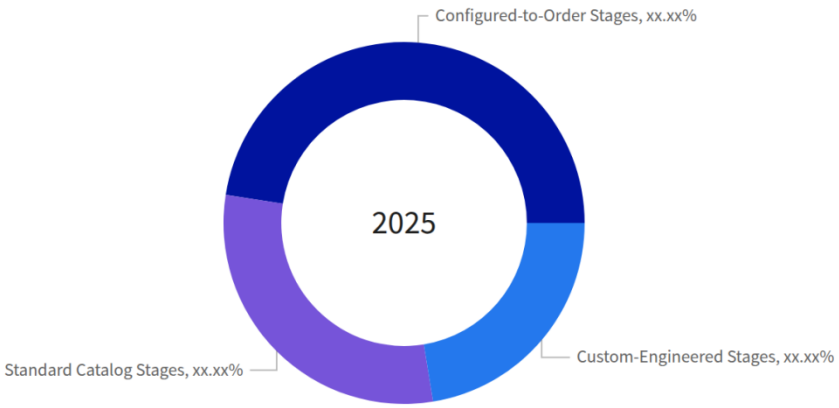


Figure 27. Global Motion Positioning Stages Market, by Customization Level, 2032 (USD Million)

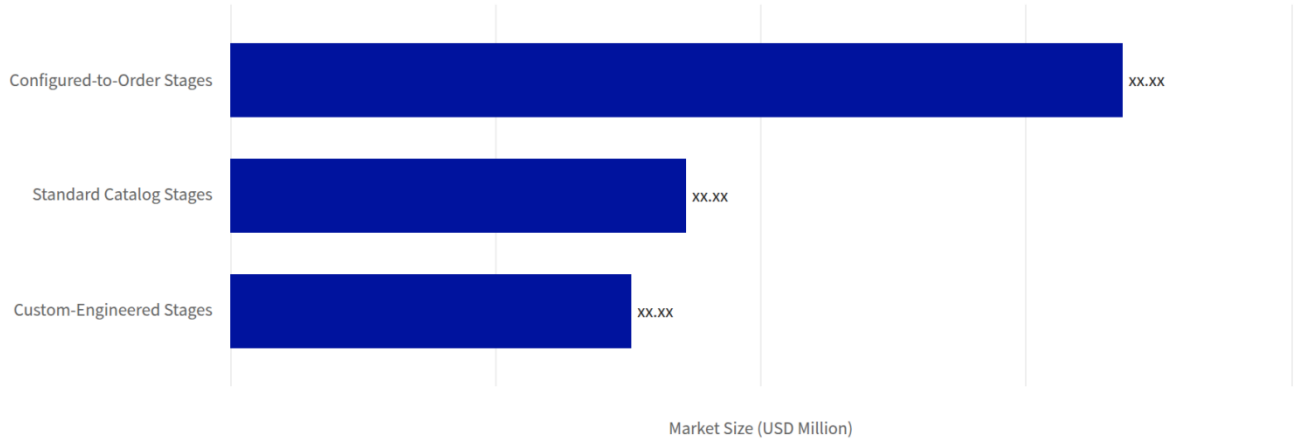


Table 194. Global Motion Positioning Stages Market, by Customization Level growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 195. Global Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Orders, Shipping & Warranties

   · Zaber distinguishes its standard-product satisfaction guarantee from case-specific guarantees for nonstandard custom products. ([zaber.com](https://www.zaber.com/ordering))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.

2. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

   · The Aerotech-authored guide distinguishes catalog, predefined configured-to-order and custom-engineered supply, illustrating PlanarDL and a custom goniometer. It also distinguishes stage-level work from retained system integration. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

   · Taxonomy evidence: The manufacturer-authored paper distinguishes standard off-the-shelf, standard configured-to-order, and custom-engineered motion solutions. This supports commercial terminology, not a verified global allocation. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

3. Zaber Technologies Gimbal

   · Zaber describes a custom gimbal comprising RST rotary stages, an external controller and custom-sized brackets, supporting distinction between stage engineering and surrounding assembly customization. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))

4. ISO 230-2:2014 - Test Code for Machine Tools - Part 2: Determination of Accuracy and Repeatability of Positioning of Numerically Controlled Axes
   - Taxonomy evidence: The official record identifies ISO xx.xx-xx.xx:2014 as confirmed in 2025 and describes its scope as positioning accuracy and repeatability evaluation for numerically controlled machine-tool axes. Analytical implication: these measurement concepts do not classify engineering customization and do not, by themselves, establish commercial price or quality tiers. ([iso.org](https://www.iso.org/standard/xx.xx.html))
   - Taxonomy evidence: The standard's stated scope concerns accuracy and repeatability evaluation of numerically controlled machine-tool axes. Analytical implication: those measurements are distinct from customization level and do not establish the omitted market-wide commercial performance tiers. ([iso.org](https://www.iso.org/standard/xx.xx.html))
5. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased from EUR xx.xx to EUR xx.xx; this counterforce tempers the modeled custom-stage growth assumption.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Sales increased from EUR xx.xx to EUR xx.xx; this counterforce tempers the modeled custom-stage growth assumption.
6. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

7. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
8. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.

9. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
10. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
11. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
12. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
13. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
14. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
15. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
16. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

17. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
18. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
19. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
20. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
21. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
22. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

23. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated automated-stage expansion informs relative demand sensitivity; it does not establish a forecast stock-catalog sales share. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and doubled supply capacity support a conditional supply-response premise, not realized configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement leaves customization mix undisclosed; the forecast does not assume all expanded capacity produces newly engineered stages.

24. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

25. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

26. Meeting the Demands of the Most Critical OEMs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
27. Zaber Technologies Gimbal - March 19, 2022
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

16.1. Configured-to-Order Stages

Table 196. Global Motion Positioning Stages Market Size, by Configured-to-Order Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 197. Global Motion Positioning Stages Market Size, by Configured-to-Order Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 198. Global Motion Positioning Stages Market Size, by Configured-to-Order Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

   · Taxonomy evidence: The paper identifies the manufacturer's PlanarDL XY stage as a standard configured-to-order product. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.

5. MISUMI Integrated Report 2025 - Business Portfolio
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
6. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
9. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and doubled supply capacity support a conditional supply-response premise, not realized configured-stage revenue.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

28. Orders, Shipping & Warranties
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
29. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
30. Meeting the Demands of the Most Critical OEMs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
31. Zaber Technologies Gimbal - March 19, 2022
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.

16.2. Standard Catalog Stages

Table 199. Global Motion Positioning Stages Market Size, by Standard Catalog Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 200. Global Motion Positioning Stages Market Size, by Standard Catalog Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 201. Global Motion Positioning Stages Market Size, by Standard Catalog Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

   · Taxonomy evidence: The procurement requests named stage model numbers, providing buyer-side evidence of purchasing predefined commercial stage offerings rather than commissioning an unspecified new design. ([tifr.res.in](https://www.tifr.res.in/maincampus/viewNoticeFile.php?f=VTNVU21UaFBybGJuRDJwakJmdXdVUT09&s=WFdXaTkwL1ZDTGdxaHp6eHA1bkh1QT09))

2. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Taxonomy evidence: Preconfigured positioning stages illustrate the author's standard off-the-shelf offering format. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

3. Positioning 2026 Business Report - HOERBIGER

· Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

· Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))

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4. MKS Inc. Annual Report 2025

· Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.

· Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
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   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated automated-stage expansion informs relative demand sensitivity; it does not establish a forecast stock-catalog sales share. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
29. Orders, Shipping & Warranties
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
30. Meeting the Demands of the Most Critical OEMs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
31. Zaber Technologies Gimbal - March 19, 2022
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))

16.3. Custom-Engineered Stages

Table 202. Global Motion Positioning Stages Market Size, by Custom-Engineered Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 203. Global Motion Positioning Stages Market Size, by Custom-Engineered Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 204. Global Motion Positioning Stages Market Size, by Custom-Engineered Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

   · Taxonomy evidence: A custom-engineered goniometer illustrates a stage designed to meet unique customer requirements. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement leaves customization mix undisclosed; the forecast does not assume all expanded capacity produces newly engineered stages.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. Orders, Shipping & Warranties
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
29. Meeting the Demands of the Most Critical OEMs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
30. Zaber Technologies Gimbal - March 19, 2022
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

17. Motion Positioning Stages Market, by Sales Channel

Sales Channel choice is constrained by appointment and portfolio rights, not merely by the presence of a local seller. Zaber identifies Laser 2000 (UK) Ltd. as exclusive for Ireland and the United Kingdom, while Edmund Optics and Digi-Key have selected-product coverage in specified territories. ■■ ■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■ ■■■■■■ ■■ ■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■ ■■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■■■■■■

Buyer eligibility can override either channel route. IISc's June 2025 cryogenic-positioning RFQ admitted Indian manufacturers or their authorized Indian distributors subject to its domestic-supplier conditions. ■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■ ■■■■■■ ■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■ ■ ■■■■■■■ ■■■■■■■■■■■■ ■ ■■■■■ ■■■■■■■■■■■■ ■■ ■■■ ■■■■■■■■■■■■■ ■ ■■■■■■■■ ■■ ■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■

Where both routes are eligible, the choice should follow the required portfolio and committed support responsibilities. A selected-product reseller can be unsuitable when the order depends on an unlisted configuration, while an authorized local channel may provide relevant sales and support access. ■■■■■■ ■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■ ■■ ■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■■ ■■■■■■■■■■■■■

Figure 28. Global Motion Positioning Stages Market Size, by Sales Channel, 2025 (%)

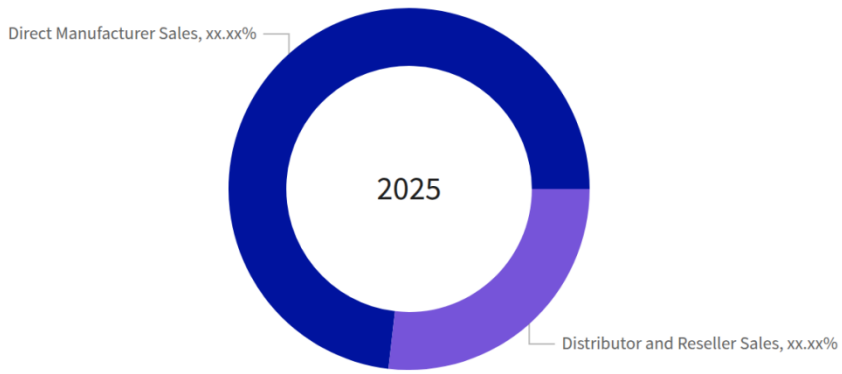


Figure 29. Global Motion Positioning Stages Market, by Sales Channel, 2032 (USD Million)

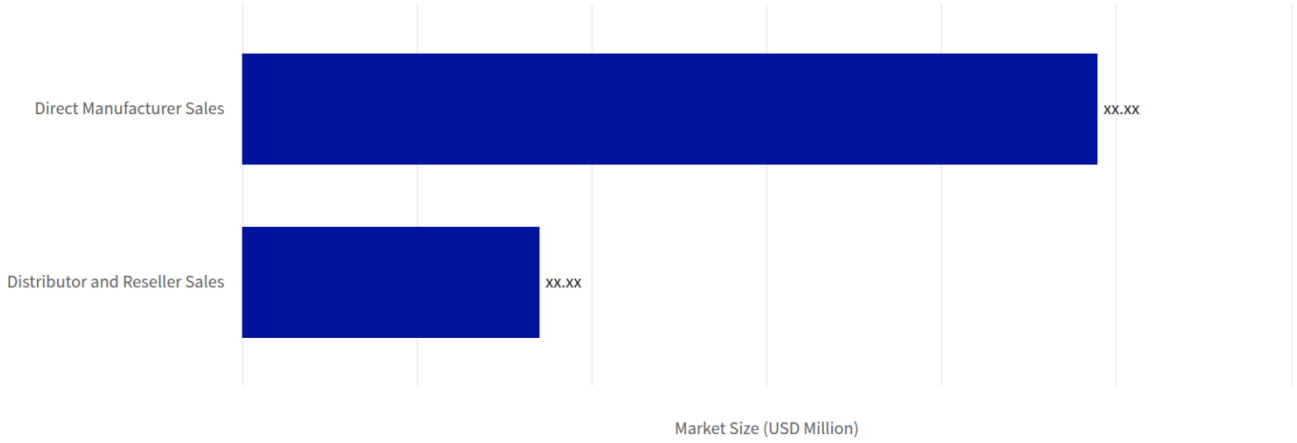


Table 205. Global Motion Positioning Stages Market, by Sales Channel growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 206. Global Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Locations and Contact - Zaber

· Zaber identifies territorial exclusivity, selected-product distributors and regions offering direct-support alternatives. Appointment and portfolio statements do not establish transaction-specific warranty equivalence. ([zaber.com](https://www.zaber.com/contact/))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

2. Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

· IISc's June xx.xx 2025 RFQ permits Indian manufacturers or authorized Indian distributors subject to domestic-supplier conditions, and does not treat local services as sufficient local value addition for imported products. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

· Taxonomy evidence: The procurement explicitly permits quotations from an Indian original equipment manufacturer or its authorized Indian distributor. This provides dated 2025 demand-side corroboration of manufacturer and distributor selling roles, without establishing an awarded channel or title-taking terms. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.

3. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1

· Taxonomy evidence: The stage RFQ expressly accepts responses from the original equipment manufacturer or its authorized Indian distributor, independently establishing the two contractual selling roles used in this axis.
([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))

4. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported demand weaknesses constrain assumptions of uniform precision-supplier expansion.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak automation and publicly funded demand provide counterevidence to uniformly strong cohort growth, affecting forecast relative weights and the complementary distributor share.
5. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
6. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
7. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
8. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.

9. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
10. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
11. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
12. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
13. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
14. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
15. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
16. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.

17. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
18. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
19. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
20. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
21. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
22. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January 2026 announcement identifies approximately JPY xx.xx investment and doubled automated-stage supply capacity. It supports a conditional precision-demand exposure, not realized sales or direct-channel penetration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same manufacturer-stage expansion informs relative cohort growth and therefore the complementary distributor allocation. Capacity is not added as revenue or assumed to determine the selling route.
23. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

24. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
25. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
26. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
27. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

17.1. Direct Manufacturer Sales

Table 207. Global Motion Positioning Stages Market Size, by Direct Manufacturer Sales, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 208. Global Motion Positioning Stages Market Size, by Direct Manufacturer Sales, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 209. Global Motion Positioning Stages Market Size, by Direct Manufacturer Sales, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

   · Taxonomy evidence: The single-quote invitation is addressed directly to the stage manufacturer, establishing a solicited direct-manufacturer procurement relationship, not proof of a completed sale. ([tifr.res.in](https://www.tifr.res.in/maincampus/viewNoticeFile.php?f=VTNVU21UaFBybGJuRDJwakJmdXdVUT09&s=WFdXaTkwL1ZDTGdxaHp6eHA1bkh1QT09))

2. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1

   · Taxonomy evidence: Original equipment manufacturers are explicitly eligible to supply the requested complete linear stage directly to the institutional purchaser. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))

3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported demand weaknesses constrain assumptions of uniform precision-supplier expansion.
4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.

8. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
10. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January 2026 announcement identifies approximately JPY xx.xx investment and doubled automated-stage supply capacity. It supports a conditional precision-demand exposure, not realized sales or direct-channel penetration.
22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.

28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

29. MKS Inc. Annual Report 2025

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.

30. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.

31. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.

32. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.

33. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

    · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.

17.2. Distributor and Reseller Sales

Table 210. Global Motion Positioning Stages Market Size, by Distributor and Reseller Sales, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 211. Global Motion Positioning Stages Market Size, by Distributor and Reseller Sales, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 212. Global Motion Positioning Stages Market Size, by Distributor and Reseller Sales, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1

   · Taxonomy evidence: An authorized distributor is explicitly eligible to supply the same complete-stage procurement. This establishes a reseller route, not a channel share or awarded transaction. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2023/xx.xx/Domestic-Tender_High-Precision-Linear-Stage_Soumen-Ghosh_IPC.pdf))

2. Positioning Stages and Systems - Motionlink Ltd

   · Taxonomy evidence: Motionlink explicitly identifies positioning tables distributed by its business, providing an independently retrieved example of a stage-distribution operation outside the Indian procurement records. ([motionlink.co.uk](https://motionlink.co.uk/motionlink/positioning-stages-and-systems/))

3. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak automation and publicly funded demand provide counterevidence to uniformly strong cohort growth, affecting forecast relative weights and the complementary distributor share.
4. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
5. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
6. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
   - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
7. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.

8. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
9. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
10. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
11. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
12. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

13. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
14. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
15. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
16. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.

17. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
18. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
19. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
20. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
21. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same manufacturer-stage expansion informs relative cohort growth and therefore the complementary distributor allocation. Capacity is not added as revenue or assumed to determine the selling route.
22. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

23. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
26. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
27. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

28. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

29. MKS Inc. Annual Report 2025

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.

30. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.

31. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.

32. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

33. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.

18. Motion Positioning Stages Market, by Operating Environment

[redacted] That ambient positioning does not establish suitability for a specialized environment. Buyers should compare the scope actually required rather than assume that a more specialized variant is necessary.

[redacted] Catalog status is therefore not synonymous with Standard-Environment Stages, and environmental specialization does not necessarily require wholly new engineering. The commercial choice is between an existing documented variant and an agreed modification, with responsibility for subsequent configuration changes kept explicit.

[redacted] Suppliers and buyers should settle the chosen configuration and its acceptance documentation before commitment. Adding another environmental condition is a trigger to reassess the quoted coverage; it is not evidence that an existing single-environment offering automatically remains acceptable.

Figure 30. Global Motion Positioning Stages Market Size, by Operating Environment, 2025 (%)

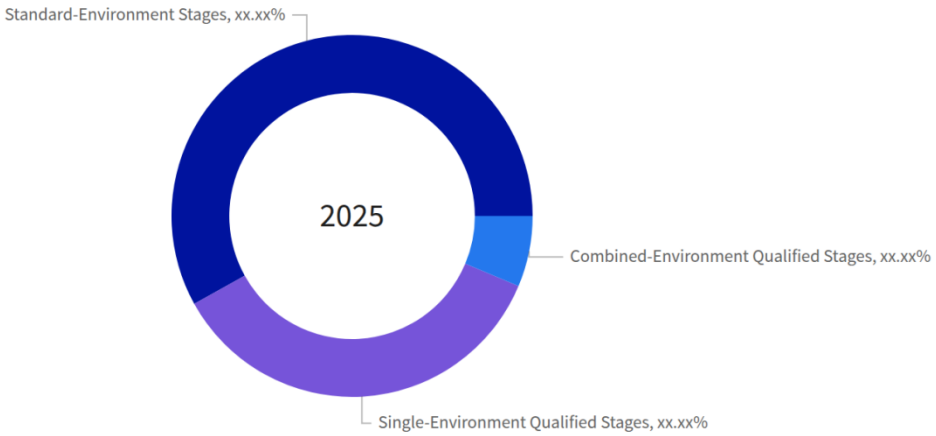


Figure 31. Global Motion Positioning Stages Market, by Operating Environment, 2032 (USD Million)

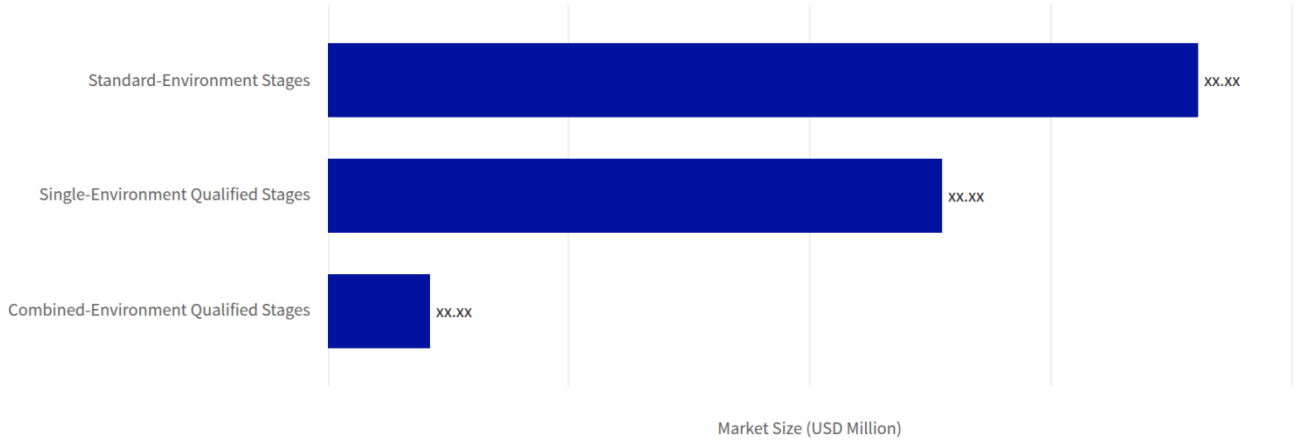


Table 213. Global Motion Positioning Stages Market, by Operating Environment growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 214. Global Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

   · PI describes vacuum-ready standard products and modifications on request, demonstrating that environmental specialization and customization level are separate commercial distinctions. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

2. Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

   · The RFQ requests cryogenic positioning, an ultrahigh-vacuum option and a nonmagnetic variant. These are purchasing requirements and options, not evidence of the combination delivered or accepted. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

   · Taxonomy evidence: The June xx.xx 2025 buyer RFQ specifies cryogenic-stage compatibility, an ultrahigh-vacuum option, and a nonmagnetic variant within one procurement, demonstrating that environmental requirements can coexist. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

3. Loan Service for Nanopositioners

   · Attocube identifies the EC*xx.xx positioners used in its loan kits as intended for ambient conditions. The statement establishes offering scope, not a completed purchase or specialized-environment acceptance. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

4. Positioning Stages and Systems - Motionlink Ltd

   · Taxonomy evidence: The company's marketed stage range distinguishes standard-environment offerings from demanding-environment options, including vacuum, cryogenic, radiation-tolerant, and nonmagnetic positioning. This is evidence of its own commercial offering, not global category shares or exclusive single-environment purchases. ([motionlink.co.uk](https://motionlink.co.uk/motionlink/positioning-stages-and-systems/))

5. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
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   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
11. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
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13. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.

14. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
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    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SEMI reports USD xx.xx of 2025 semiconductor-equipment billings from member and SEAJ submissions, anchoring the inherited semiconductor demand proxy after an assumed merchant-stage-content adjustment. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI reports USD xx.xx of 2025 semiconductor-equipment billings from member and SEAJ submissions, anchoring the inherited semiconductor demand proxy after an assumed merchant-stage-content adjustment. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The adjusted semiconductor activity pool constrains the shared allocation weights; environmental incidence within that pool is modeled, not reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The adjusted semiconductor activity pool constrains the shared allocation weights; environmental incidence within that pool is modeled, not reported.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same scoped activity anchor enters the combined-profile numerator and sibling denominator without substituting complete-equipment revenue for stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same scoped activity anchor enters the combined-profile numerator and sibling denominator without substituting complete-equipment revenue for stage revenue.

16. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025. The inherited model uses xx.xx as a rounded automation-activity benchmark, not stage shipments. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025. The inherited model uses xx.xx as a rounded automation-activity benchmark, not stage shipments. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The benchmark constrains the other-industrial pool after assumed stage attachment and realization adjustments; it does not disclose qualified-stage incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The benchmark constrains the other-industrial pool after assumed stage attachment and realization adjustments; it does not disclose qualified-stage incidence.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The calibrated industrial pool contributes to the common environmental denominator and a separately assumed combined-profile numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The calibrated industrial pool contributes to the common environmental denominator and a separately assumed combined-profile numerator.
17. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
18. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
19. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
20. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
21. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.

22. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.
23. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
24. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

25. 1" (25 mm) Travel Dovetail Translation Stages
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
26. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
27. Low Temperature Nanopositioners
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

28. Cleanroom | Festo USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

18.1. Standard-Environment Stages

Table 215. Global Motion Positioning Stages Market Size, by Standard-Environment Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 216. Global Motion Positioning Stages Market Size, by Standard-Environment Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 217. Global Motion Positioning Stages Market Size, by Standard-Environment Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Loan Service for Nanopositioners

   · Taxonomy evidence: The manufacturer explicitly describes its EC*xx.xx positioner product line as intended for ambient conditions. The inspected page concerns loan kits; loan activity is not counted as new-stage market revenue.
   ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue.
   ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue.
   ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
3. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
6. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
7. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
10. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SEMI reports USD xx.xx of 2025 semiconductor-equipment billings from member and SEAJ submissions, anchoring the inherited semiconductor demand proxy after an assumed merchant-stage-content adjustment. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI reports USD xx.xx of 2025 semiconductor-equipment billings from member and SEAJ submissions, anchoring the inherited semiconductor demand proxy after an assumed merchant-stage-content adjustment. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025. The inherited model uses xx.xx as a rounded automation-activity benchmark, not stage shipments. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025. The inherited model uses xx.xx as a rounded automation-activity benchmark, not stage shipments. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
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    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))

20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
26. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
28. 1" (25 mm) Travel Dovetail Translation Stages
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
29. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
30. Cleanroom | Festo USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))

18.2. Single-Environment Qualified Stages

Table 218. Global Motion Positioning Stages Market Size, by Single-Environment Qualified Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 219. Global Motion Positioning Stages Market Size, by Single-Environment Qualified Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 220. Global Motion Positioning Stages Market Size, by Single-Environment Qualified Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   - Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
4. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
5. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
6. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The adjusted semiconductor activity pool constrains the shared allocation weights; environmental incidence within that pool is modeled, not reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The adjusted semiconductor activity pool constrains the shared allocation weights; environmental incidence within that pool is modeled, not reported.
12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The benchmark constrains the other-industrial pool after assumed stage attachment and realization adjustments; it does not disclose qualified-stage incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The benchmark constrains the other-industrial pool after assumed stage attachment and realization adjustments; it does not disclose qualified-stage incidence.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
19. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

25. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
26. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
27. 1" (25 mm) Travel Dovetail Translation Stages
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
28. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
29. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
30. Cleanroom | Festo USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

18.3. Combined-Environment Qualified Stages

Table 221. Global Motion Positioning Stages Market Size, by Combined-Environment Qualified Stages, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 222. Global Motion Positioning Stages Market Size, by Combined-Environment Qualified Stages, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 223. Global Motion Positioning Stages Market Size, by Combined-Environment Qualified Stages, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Indian Institute of Science - Request for Quote for Supply of Closed-Loop Cryogenic Nanopositioning System

   · Taxonomy evidence: The June xx.xx 2025 RFQ requests a cryogenic positioning system and lists ultrahigh-vacuum compatibility as an option and a nonmagnetic construction variant. It establishes selectable combined environmental requirements, not the exact variant ultimately ordered, completed qualification, or delivery. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

   · Taxonomy evidence: The requested cryogenic nanopositioning system includes vacuum and nonmagnetic compatibility requirements or options. This supports preserving combined profiles, while not establishing which options were ultimately ordered or delivered. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

2. Positioning 2026 Business Report - HOERBIGER
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
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4. SIGMAKOKI Integrated Report 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
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   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
5. MISUMI Integrated Report 2025 - Business Portfolio
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
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   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
8. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.

9. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
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    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
11. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

12. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
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    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same scoped activity anchor enters the combined-profile numerator and sibling denominator without substituting complete-equipment revenue for stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The same scoped activity anchor enters the combined-profile numerator and sibling denominator without substituting complete-equipment revenue for stage revenue.
13. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The calibrated industrial pool contributes to the common environmental denominator and a separately assumed combined-profile numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The calibrated industrial pool contributes to the common environmental denominator and a separately assumed combined-profile numerator.

14. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
15. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
16. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
17. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
18. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
19. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.
20. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.

21. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
22. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
25. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.

26. Locations and Contact - Zaber

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

27. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

28. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

29. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

30. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

19. Motion Positioning Stages Market, by Region

[illegible] An Equipment OEM standardizing stages across these destinations should identify the responsible engineering and service entity for each installation. A regional relationship can consolidate communication, but it does not establish identical local repair, import or acceptance arrangements.

[illegible] This provides a concrete starting point for negotiating stage supply and continuing support, rather than relying solely on reseller access. Buyers should nevertheless establish the service destination and return arrangements for Canadian or Mexican installations instead of extending a U.S. facility commitment across the region.

Latin American entry through Brazil depends on an import-capable contracting party, not geographic proximity alone. Brazil's federal guidance generally requires companies conducting foreign trade to obtain Siscomex authorization and register their representatives. [illegible]

Europe offers supplier-specific engineering hubs rather than interchangeable local representation. [illegible] Buyers outside the hub's jurisdiction still need agreed documentation, service and return responsibilities; regional presence is not a substitute for those commitments.

Middle Eastern coverage can be administered from outside the region. Aerotech assigns Israel to its United Kingdom organization, demonstrating that a listed destination does not necessarily have an in-country manufacturer service operation. [illegible]

[illegible]

[redacted] Suppliers seeking government-funded stage purchases should establish the actual solicitation and service responsibility before committing to representation. An Africa-wide stage-service arrangement cannot be inferred from this registration route, and equivalent coverage in other African countries remains a separate commercial question.

Figure 32. Global Motion Positioning Stages Market, by Region: Market share evolution, 2025-2032

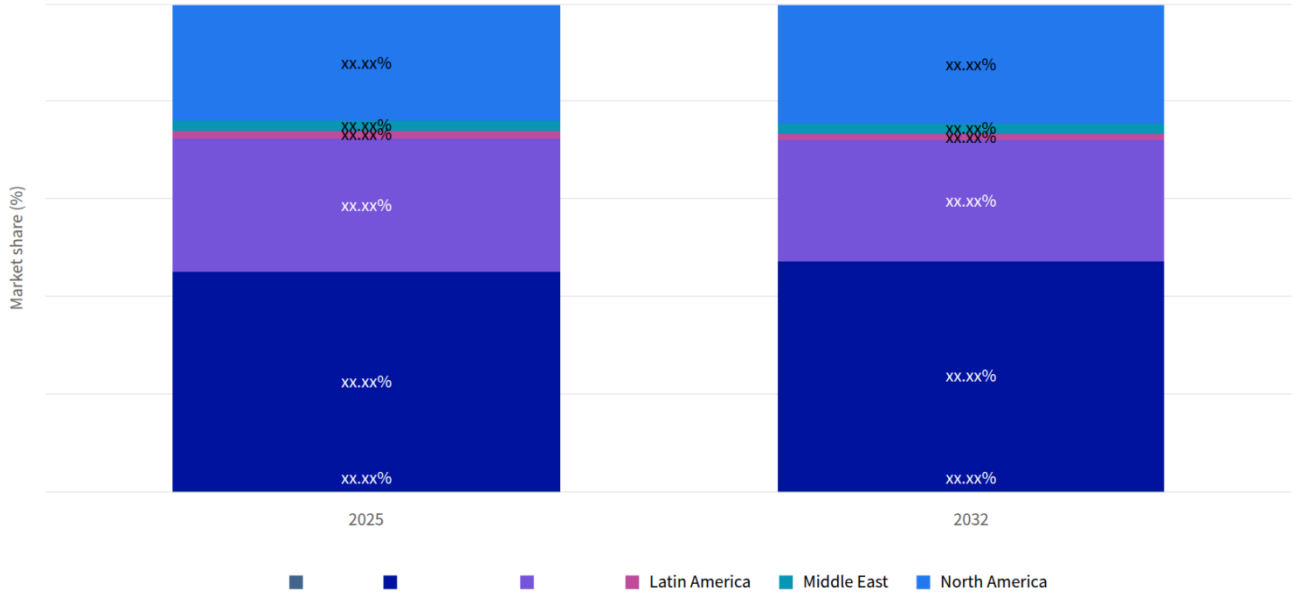


Figure 33. Global Motion Positioning Stages Market, by Region: Market size by category, 2025

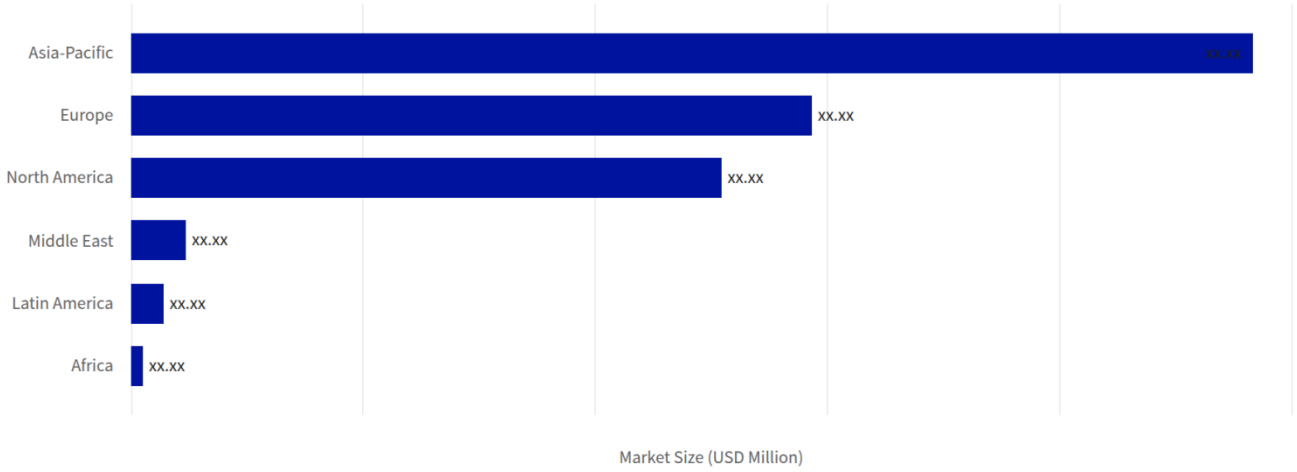


Figure 34. Global Motion Positioning Stages Market, Regional growth by Purchasing Role, 2025-2032 (CAGR %)

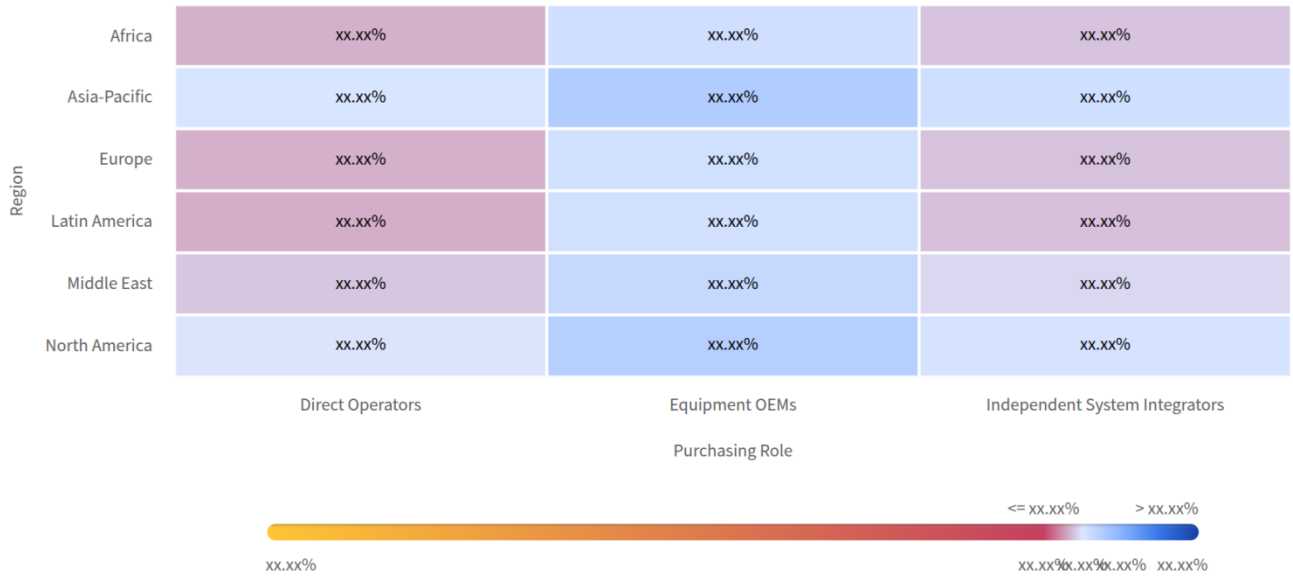


Table 224. Global Motion Positioning Stages Market, by Region growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 225. Global Motion Positioning Stages Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Asia-Pacific	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Europe	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latin America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Middle East	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North America	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. About Us | Your Motion Control Partner
   · Aerotech records establishing its Fürth integration, metrology and manufacturing facility in 2017 and expanding into a second Pittsburgh facility in 2020. These are documented facility events, not buyer-specific service commitments. ([aerotech.com](https://www.aerotech.com/about/))
2. Contact Your Global Precision Motion Partner | Aerotech
   · Aerotech lists China, Taiwan and Singapore as full-service locations, assigns India to its Singapore organization, and assigns Israel to its United Kingdom organization. ([aerotech.com](https://www.aerotech.com/contact/?mapState=showMap))
3. Solicitar credenciamento de empresa para operar no Siscomex
   · Brazil's federal service states that companies generally need Siscomex authorization and registered representatives to conduct foreign-trade operations. The importer-versus-intermediary choice is a conditional commercial implication. ([gov.br](https://www.gov.br/pt-br/servicos/credenciar-pessoa-juridica-no-siscomex))
4. How do I register on the central supplier database for government?
   · South African government guidance provides Central Supplier Database self-registration for prospective government suppliers; it does not establish stage qualification, awards or regional service coverage. ([gov.za](https://www.gov.za/faq/finance-business/how-do-i-register-central-supplier-database-government))
5. Positioning 2026 Business Report - HOERBIGER
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
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13. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
14. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
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    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
16. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
17. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
18. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
19. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
20. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

21. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
22. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
23. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
24. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
25. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
26. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
27. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.

28. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
29. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.

19.1. Asia-Pacific

Table 226. Asia-Pacific Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Indonesia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malaysia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Philippines	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Singapore	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Taiwan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Thailand	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 227. Asia-Pacific Motion Positioning Stages Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Indonesia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malaysia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Philippines	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Singapore	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Taiwan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Thailand	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 228. Asia-Pacific Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 229. Asia-Pacific Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 230. Asia-Pacific Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 231. Asia-Pacific Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 232. Asia-Pacific Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 233. Asia-Pacific Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 234. Asia-Pacific Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 235. Asia-Pacific Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 236. Asia-Pacific Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 237. Asia-Pacific Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 238. Asia-Pacific Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 239. Asia-Pacific Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 240. Asia-Pacific Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Fiscal-May-2025 sales were xx.xx% Japan and xx.xx% other Asia; this supplier-specific mix challenges extrapolation from a single supplier footprint.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2025 semiconductor-equipment spending provides an independent demand-context check; fab geography is not copied into merchant-stage shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Taiwanese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Taiwanese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement identifies optical-transceiver equipment demand and planned stage-capacity expansion; it supports a conditional commercial driver, not realized sales or a production-location demand allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
23. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.

24. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
25. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

26. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
27. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

28. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
29. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
30. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
31. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

32. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
33. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
34. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
35. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
36. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
37. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
38. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
39. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

40. Linear Translation Stages and NanoPositioners Overview - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

41. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

42. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

43. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

44. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

45. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

46. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

47. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

48. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

49. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

50. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

51. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

52. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
53. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
54. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
55. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
56. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

57. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
58. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
59. X-LSQ075A Specifications - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
60. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

61. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

62. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

63. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

64. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
65. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
66. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
67. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

68. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
69. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
70. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
71. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
72. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

73. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
74. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
75. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

76. Orders, Shipping & Warranties

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.

77. AlgaPro TE300 AI Phytoplankton Monitoring

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.

78. Novanta Inc. - 2024 Annual Report

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.

79. KAP Consulting - Motion Control Sales & Integration

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

80. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

81. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

82. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

83. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
84. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
85. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
86. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
87. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

88. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

89. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

90. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

91. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

92. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

93. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

94. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
95. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
96. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
97. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

98. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

99. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

100. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

101. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

102. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

103. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

104. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

19.2. Europe

Table 241. Europe Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Austria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Norway	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Switzerland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 242. Europe Motion Positioning Stages Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Austria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Norway	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Switzerland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 243. Europe Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 244. Europe Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 245. Europe Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 246. Europe Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 247. Europe Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 248. Europe Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 249. Europe Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 250. Europe Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 251. Europe Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 252. Europe Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 253. Europe Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 254. Europe Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 255. Europe Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% European sales, illustrating supplier-specific geographic heterogeneity.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: European equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

22. Locations and Contact - Zaber
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Four-country Nordic and UK/Ireland territorial listings support the distinction between shared channels and national purchasing; no sales uplift is inferred.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
23. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.

24. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
25. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

26. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
27. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

28. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
29. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
30. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
31. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

32. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
33. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
34. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
35. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
36. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
37. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
38. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
39. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

40. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
41. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

42. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

43. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

44. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

45. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

46. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

47. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

48. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

49. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

50. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

51. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

52. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
53. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
54. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
55. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
56. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

57. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

58. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

59. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

60. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

61. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

62. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

63. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

64. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
65. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
66. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
67. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

68. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
69. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
70. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
71. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
72. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

73. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
74. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
75. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

76. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
77. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
78. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
79. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.

83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.

84. Manual Positioning Stages - MISUMI

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.

85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.

86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
87. Simplified Motion Series - Festo USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.
89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

19.3. North America

Table 256. North America Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 257. North America Motion Positioning Stages Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 258. North America Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 259. North America Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 260. North America Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 261. North America Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 262. North America Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 263. North America Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 264. North America Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 265. North America Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 266. North America Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 267. North America Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 268. North America Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 269. North America Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 270. North America Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: North American equipment spending declined xx.xx% to USD xx.xx in 2025, qualifying uniform stage-growth assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
23. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.

24. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
25. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

26. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
27. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

28. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
29. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
30. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
31. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

32. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
33. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
34. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
35. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
36. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
37. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
38. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
39. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

40. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
41. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

42. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

43. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

44. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

45. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

46. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

47. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

48. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641113.pdf))

49. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

50. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

51. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

52. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
53. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
54. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
55. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
56. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

57. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
58. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
59. X-LSQ075A Specifications - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
60. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

61. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

62. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

63. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

64. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
65. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
66. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
67. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

68. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
69. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
70. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
71. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
72. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

73. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
74. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
75. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

76. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
77. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
78. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
79. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

80. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

81. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

82. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

83. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
84. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
85. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
86. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
87. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

88. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

89. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

90. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

91. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

92. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

93. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

94. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
95. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
96. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
97. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

98. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

99. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

100. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

101. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

102. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

103. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

104. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

19.4. Middle East

Table 271. Middle East Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Israel	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Qatar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Saudi Arabia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turkey	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Arab Emirates	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 272. Middle East Motion Positioning Stages Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Israel	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Qatar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Saudi Arabia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turkey	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Arab Emirates	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 273. Middle East Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 274. Middle East Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 275. Middle East Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 276. Middle East Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 277. Middle East Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 278. Middle East Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 279. Middle East Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 280. Middle East Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 281. Middle East Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 282. Middle East Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 283. Middle East Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 284. Middle East Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 285. Middle East Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.

24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.

30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.

37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.
39. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

19.5. Latin America

Table 286. Latin America Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Argentina	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Chile	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Colombia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Peru	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 287. Latin America Motion Positioning Stages Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Argentina	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Chile	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Colombia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Peru	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 288. Latin America Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 289. Latin America Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 290. Latin America Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 291. Latin America Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 292. Latin America Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 293. Latin America Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 294. Latin America Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 295. Latin America Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 296. Latin America Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 297. Latin America Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 298. Latin America Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 299. Latin America Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 300. Latin America Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial-input allocation premise.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.

24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

26. G-RST Family - Two-Axis Gimbal Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.

28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.

29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.

30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.

37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.
39. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.

64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.

65. ZEISS concludes fiscal year 2024/25 with solid growth
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.

66. TRUMPF Annual Report 2024/25
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

19.6. Africa

Table 301. Africa Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Egypt	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Kenya	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nigeria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 302. Africa Motion Positioning Stages Market Size, by Region, 2017-2040 (USD Million)

Region	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Egypt	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Kenya	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Nigeria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 303. Africa Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 304. Africa Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 305. Africa Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 306. Africa Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 307. Africa Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 308. Africa Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 309. Africa Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 310. Africa Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 311. Africa Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 312. Africa Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 313. Africa Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 314. Africa Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 315. Africa Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial composition, regional coverage and growth constrain the modeled allocation; they do not measure stage sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Egypt manufacturing/technology inputs xx.xx/xx.xx and country growth support its distinct proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Egypt manufacturing/technology inputs xx.xx/xx.xx and country growth support its distinct proxy.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Kenya manufacturing/technology inputs xx.xx/xx.xx and country growth support its distinct proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Kenya manufacturing/technology inputs xx.xx/xx.xx and country growth support its distinct proxy.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nigeria manufacturing/technology inputs xx.xx/xx.xx and country growth support its distinct proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nigeria manufacturing/technology inputs xx.xx/xx.xx and country growth support its distinct proxy.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Africa manufacturing/technology inputs xx.xx/xx.xx and weaker industrial growth support its distinct proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: South Africa manufacturing/technology inputs xx.xx/xx.xx and weaker industrial growth support its distinct proxy.

22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

20. Motion Positioning Stages Market, by Group

Americas and Europe, Middle East & Africa require explicit country-and-portfolio mandates. ■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■ ■■■■■■ ■■■ ■■■ ■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■ ■■■ ■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ Regional channel consolidation should preserve their actual contractual boundaries.

ASEAN's shared customs infrastructure supports document exchange rather than automatic stage access. ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■ ■■■■ ■ ■■■■■■■ ■■■ ■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■ ■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■ ■■■■■■■■■■■■ ■■■ ■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ Direct shipment remains an alternative when consolidation offers no documented commercial advantage.

GCC hub planning has a shared customs foundation but still requires destination-specific execution. ■■■ ■■■■■ ■■■■ ■■■■■■■ ■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■ ■ ■■■■■■ ■■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■ ■■■■■■ ■■ ■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■ ■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■■■■■■ The shared guide is not a current clearance determination for a selected stage.

Australasia offers a more specific mutual-recognition mechanism. ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■ ■■■■ ■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■ ■■■■ ■■ ■■■ ■■■■■■■■ ■■■ ■■■■ ■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■ ■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■ ■■■■■■■ ■■■ ■■■■■■■ ■■ ■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■■ Separate national arrangements remain preferable when the selected package falls outside the applicable recognition route.

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The European Union provides a shared machinery framework for covered assemblies. The Machinery Regulation becomes mandatory on January xx.xx 2027, while the Commission distinguishes mandatory essential requirements from voluntary harmonized standards. ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■ ■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■ ■■■■■■■■■■■■

[illegible] India's local-content framework and China's ownership-neutral treatment of qualifying domestic production still require separate assessments. A supplier should use a cross-member partner only for demonstrable bidding, importing or service capabilities, rather than assume that the relationship creates a procurement preference.

G7 coordination can affect the execution of an international order without defining a common stage market-access regime. [illegible] For stage suppliers, the implication is destination, counterparty and applicable-permission review before commitment-not an assumption that every precision stage is prohibited or that an allied supplier is automatically eligible.

NATO presents a procurement mechanism rather than general commercial authorization. Its procurement portal states that opportunities are generally reserved for firms registered in member nations, with exceptions and eligibility specified by each call. [illegible]

Figure 35. Global Motion Positioning Stages Market Size, by Group, 2025 vs 2026 vs 2032

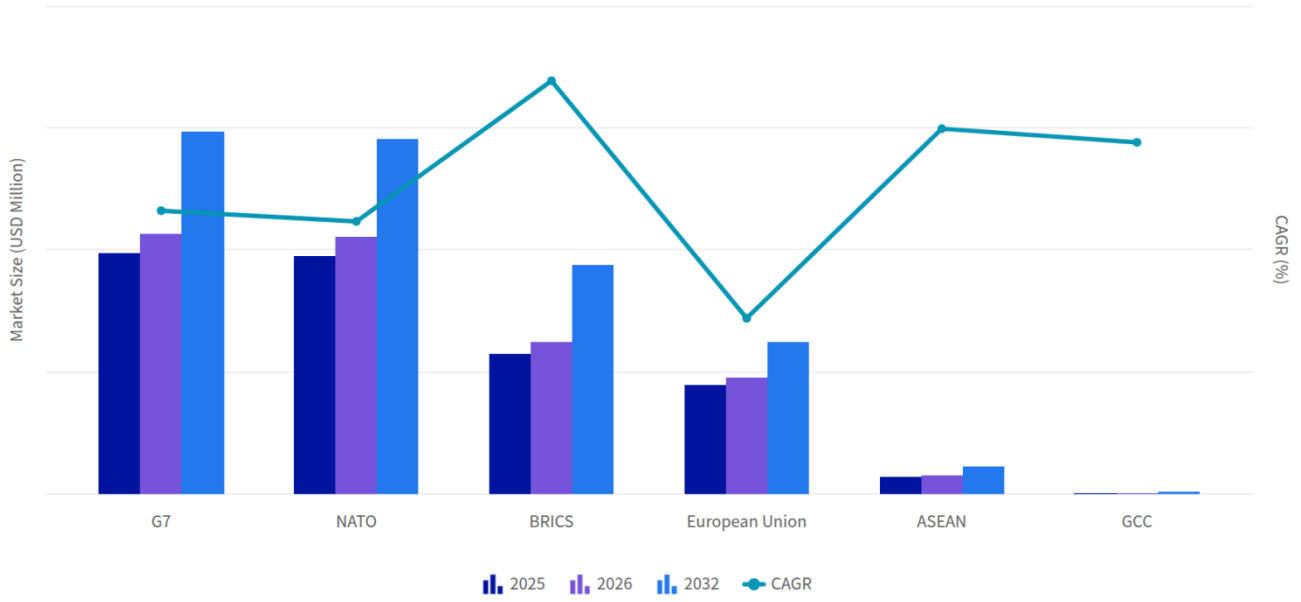


Table 316. Global Motion Positioning Stages Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
ASEAN	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
BRICS	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
European Union	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
G7	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
GCC	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
NATO	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Sources & Evidence

1. Locations and Contact - Zaber
   · Zaber lists AVR Optics for microscopy in Canada, Mexico and the United States; Laser 2000 (UK) exclusively for Ireland and the United Kingdom; and Tillquist for Denmark, Finland, Norway and Sweden. ([zaber.com](https://www.zaber.com/contact/))
2. Machinery - European Commission
   · The European Commission states that the Machinery Regulation becomes mandatory on January xx.xx 2027, and distinguishes mandatory essential requirements from voluntary harmonized standards. Individual stage classification is not established. ([single-market-economy.ec.europa.eu](https://single-market-economy.ec.europa.eu/sectors/mechanical-engineering/machinery_en))
3. Electronic Exchange of Form D via the ASEAN Single Window (ASW) | Singapore Customs
   · Singapore Customs describes ATIGA electronic Form D exchange through the ASEAN Single Window and preferential treatment associated with that documentation. This establishes a trade-document mechanism, not stage-specific approval. ([customs.gov.sg](https://www.customs.gov.sg/doing-business/rules-of-origin/origin-documentation/electronic-exchange-of-form-d-via-the-asean-single-window/))
4. Unified Guide for Customs Procedures at First Points of Entry into the Member States of the GCC
   · The GCC's 2015 unified guide describes first-entry customs procedures, evidence of importer activity, and competent-authority approvals for restricted goods. It does not determine a selected stage's current national clearance. ([gcc-sg.org](https://gcc-sg.org/en/MediaCenter/DigitalLibrary/Documents/xx.xx.pdf))
5. Issuing a Shipment Certificate for Imported Products (Products Are Not for Direct Marketing to the Consumer)
   · SASO separately describes a shipment-certificate service for imported products not directly marketed to consumers, supporting a national documentation distinction within GCC planning. ([saso.gov.sa](https://www.saso.gov.sa/en/eservices/pages/details.aspx?serviceid=xx.xx))
6. Reducing technical barriers to trade | Department of Industry, Science and Resources
   · Australian government guidance describes trans-Tasman recognition for legally sold goods and identifies exclusions and exemption mechanisms. It does not establish buyer-specific stage acceptance or identical service obligations. ([industry.gov.au](https://www.industry.gov.au/trade/reducing-technical-barriers-trade))
7. Statement by President Cyril Ramaphosa to the Extraordinary BRICS Leaders' Meeting, 8 September 2025
   · South Africa's September xx.xx 2025 statement calls for addressing BRICS non-tariff barriers and implementing an economic partnership strategy. It supports an agenda of cooperation, not a completed stage-purchasing authorization. ([dirco.gov.za](https://dirco.gov.za/statement-by-president-cyril-ramaphosa-to-the-extraordinary-brics-leaders-meeting-xx.xx-september-2025/?utm_source=openai))

8. Department for Promotion of Industry and Internal Trade - Annual Report 2024-2025
   · DPIIT's 2024-2025 report describes national local-content and bidding requirements, supporting the distinction between BRICS cooperation and country-specific procurement access. ([dpiit.gov.in](https://www.dpiit.gov.in/static/uploads/2025/xx.xx/e266b2694ebc0cbfa72a929e22790301.pdf))
9. Ministry of Finance of the People's Republic of China - Government Procurement Equal-Treatment Policy Notice
   · China's Ministry of Finance provides an ownership-neutral rule for relevant products manufactured domestically, illustrating a national procurement gate distinct from India's local-content framework. ([gks.mof.gov.cn](https://gks.mof.gov.cn/ywwz_14775/Policies/xx.xx/t20211027_3761415.htm))
10. Minister Anand announces major additional sanctions in relation to Russia's war of aggression against Ukraine
   · Canada's June 2025 announcement describes additional Russia-related trade restrictions following the G7 summit and coordination with allies. It does not classify every positioning stage or proposed transaction. ([canada.ca](https://www.canada.ca/en/global-affairs/news/2025/xx.xx/minister-anand-announces-major-additional-sanctions-in-relation-to-russias-war-of-aggression-against-ukraine.html))
11. Procurement Opportunities | NATO
   · NATO states that procurement opportunities are generally reserved for firms registered in member nations, with exceptions and eligibility specified in each call; evaluation is performed by the respective procuring body. ([nato.int](https://www.nato.int/en/work-with-us/business-and-project-opportunities/procurement-opportunities))
12. Positioning 2026 Business Report - HOERBIGER
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
13. MKS Inc. Annual Report 2025
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.
14. SIGMAKOKI Integrated Report 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
15. MISUMI Integrated Report 2025 - Business Portfolio
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
16. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.

17. Festo startet optimistisch ins Jubiläumsjahr
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
18. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
19. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
20. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
21. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
22. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
23. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
24. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.

25. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
26. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
27. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
28. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
29. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
30. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
31. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.

20.1. G7

Table 317. G7 Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 318. G7 Motion Positioning Stages Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 319. G7 Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 320. G7 Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 321. G7 Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 322. G7 Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 323. G7 Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 324. G7 Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 325. G7 Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 326. G7 Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 327. G7 Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 328. G7 Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 329. G7 Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 330. G7 Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 331. G7 Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
24. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.

25. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
26. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

27. G-RST Family - Two-Axis Gimbal Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

28. 40mm, English Micrometer Tilt Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.

29. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.

30. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.

31. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
32. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
33. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
34. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
35. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
36. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
37. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.

38. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
39. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.
40. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
41. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

42. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

43. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

44. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

45. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

46. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

47. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

48. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

49. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

50. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

51. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

52. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
53. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
54. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
55. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
56. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

57. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
58. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
59. X-LSQ075A Specifications - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
60. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

61. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

62. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

63. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

64. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
65. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
66. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
67. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

68. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
69. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
70. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
71. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
72. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

73. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
74. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
75. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

76. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
77. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
78. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
79. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

80. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

81. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

82. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

83. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
84. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
85. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
86. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
87. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

88. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

89. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

90. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

91. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

92. Meeting the Demands of the Most Critical OEMs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
93. Zaber Technologies Gimbal - March 19, 2022
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

94. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
95. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
96. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
97. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

98. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

99. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

100. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

101. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

102. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

103. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

104. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

20.2. NATO

Table 332. NATO Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Albania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Bulgaria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Croatia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Czech Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Estonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Greece	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hungary	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Iceland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latvia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lithuania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Luxembourg	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Montenegro	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 332 - continued

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North Macedonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Norway	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Romania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovakia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovenia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turkey	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 333. NATO Motion Positioning Stages Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Albania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Bulgaria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Croatia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Czech Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Estonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Greece	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hungary	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 333 - continued

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Iceland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latvia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lithuania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Luxembourg	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Montenegro	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
North Macedonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Norway	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Romania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovakia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovenia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Turkey	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 334. NATO Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 335. NATO Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 336. NATO Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 337. NATO Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 338. NATO Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 339. NATO Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 340. NATO Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 341. NATO Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 342. NATO Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 343. NATO Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 344. NATO Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 345. NATO Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 346. NATO Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
24. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.

25. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
26. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

27. G-RST Family - Two-Axis Gimbal Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

28. 40mm, English Micrometer Tilt Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.

29. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.

30. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.

31. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
32. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
33. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
34. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
35. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
36. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
37. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.

38. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
39. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.
40. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
41. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

42. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

43. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

44. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

45. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

46. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

47. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

48. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

49. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

50. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

51. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

52. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
53. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
54. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
55. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
56. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

57. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
58. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
59. X-LSQ075A Specifications - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
60. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

61. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

62. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

63. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

64. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
65. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
66. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
67. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

68. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
69. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
70. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
71. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
72. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

73. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
74. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
75. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

76. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
77. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
78. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
79. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

80. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

81. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

82. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

83. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
84. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
85. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
86. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
87. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

88. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

89. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

90. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

91. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

92. Meeting the Demands of the Most Critical OEMs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
93. Zaber Technologies Gimbal - March 19, 2022
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

94. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
95. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
96. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
97. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

98. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

99. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

100. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

101. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

102. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

103. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

104. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

20.3. BRICS

Table 347. BRICS Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 348. BRICS Motion Positioning Stages Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Africa	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 349. BRICS Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 350. BRICS Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 351. BRICS Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 352. BRICS Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 353. BRICS Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 354. BRICS Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 355. BRICS Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 356. BRICS Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 357. BRICS Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 358. BRICS Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 359. BRICS Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 360. BRICS Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 361. BRICS Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
23. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
24. UNIDO - Factsheet: Africa, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: South Africa manufacturing/technology inputs xx.xx/xx.xx and weaker industrial growth support its distinct proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: South Africa manufacturing/technology inputs xx.xx/xx.xx and weaker industrial growth support its distinct proxy.
25. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

26. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
27. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
28. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

29. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
30. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

31. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
32. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
33. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
34. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

35. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
36. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
37. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
38. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
39. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
40. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
41. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
42. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

43. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
44. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

45. X-LDQ-AE Precision Linear Motor Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

46. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

47. RSM-E Motorized Rotation Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

48. LC40 Features - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

49. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

50. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

51. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

52. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

53. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

54. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

55. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
56. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
57. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
58. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
59. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

60. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
61. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
62. X-LSQ075A Specifications - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
63. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

64. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

65. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

66. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

67. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
68. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
69. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
70. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

71. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
72. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
73. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
74. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
75. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

76. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
77. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
78. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

79. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
80. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
81. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
82. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

83. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

84. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

85. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

86. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
87. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
88. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
89. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
90. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

91. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

92. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

93. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

94. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

95. Meeting the Demands of the Most Critical OEMs
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
96. Zaber Technologies Gimbal - March 19, 2022
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

97. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
98. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
99. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
100. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

101. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

102. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

103. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

104. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

105. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

106. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

107. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

20.4. European Union

Table 362. European Union Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Austria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Bulgaria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Croatia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cyprus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Czech Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Estonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Greece	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hungary	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ireland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latvia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lithuania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Luxembourg	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malta	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Romania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovakia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovenia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 363. European Union Motion Positioning Stages Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Austria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Belgium	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Bulgaria	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Croatia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cyprus	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Czech Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Denmark	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Estonia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Finland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Greece	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hungary	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ireland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Latvia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lithuania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Luxembourg	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malta	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Netherlands	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Poland	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Portugal	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Romania	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovakia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Slovenia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sweden	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 364. European Union Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 365. European Union Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 366. European Union Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 367. European Union Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 368. European Union Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 369. European Union Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 370. European Union Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 371. European Union Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 372. European Union Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 373. European Union Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 374. European Union Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 375. European Union Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 376. European Union Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Cyprus national inputs; catalog parent remains Europe.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Cyprus national inputs; catalog parent remains Europe.
23. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
24. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.

25. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
26. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

27. G-RST Family - Two-Axis Gimbal Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

28. 40mm, English Micrometer Tilt Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.

29. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.

30. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.

31. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
32. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
33. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
34. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
35. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
36. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
37. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.

38. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
39. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.
40. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
41. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

42. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

43. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

44. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

45. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

46. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

47. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

48. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

49. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

50. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

51. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

52. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
53. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
54. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
55. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
56. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

57. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

58. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

59. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

60. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

61. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

62. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

63. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

64. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
65. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
66. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
67. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

68. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
69. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
70. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
71. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
72. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

73. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
74. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
75. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

76. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
77. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
78. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
79. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

80. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

81. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

82. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

83. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
84. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
85. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
86. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
87. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

88. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

89. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

90. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

91. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

92. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

93. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

94. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
95. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
96. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
97. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

98. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

99. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

100. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

101. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

102. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

103. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

104. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

20.5. ASEAN

Table 377. ASEAN Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Brunei	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cambodia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Indonesia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lao People's Democratic Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malaysia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Myanmar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Philippines	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Singapore	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Thailand	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vietnam	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 378. ASEAN Motion Positioning Stages Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Brunei	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cambodia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Indonesia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Lao People's Democratic Republic	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Malaysia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Myanmar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Philippines	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Singapore	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Thailand	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Vietnam	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 379. ASEAN Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 380. ASEAN Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 381. ASEAN Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 382. ASEAN Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 383. ASEAN Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 384. ASEAN Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 385. ASEAN Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 386. ASEAN Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 387. ASEAN Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 388. ASEAN Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 389. ASEAN Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 390. ASEAN Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 391. ASEAN Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI

    · Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.

18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI

    · Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.

    · Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.

    · Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
    ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.

    · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

20.6. GCC

Table 392. GCC Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Bahrain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Kuwait	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Oman	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Qatar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Saudi Arabia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Arab Emirates	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 393. GCC Motion Positioning Stages Market Size, by Group, 2017-2040 (USD Million)

Group	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Bahrain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Kuwait	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Oman	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Qatar	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Saudi Arabia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Arab Emirates	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx

Table 394. GCC Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 395. GCC Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 396. GCC Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 397. GCC Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 398. GCC Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 399. GCC Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 400. GCC Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 401. GCC Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 402. GCC Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 403. GCC Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 404. GCC Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 405. GCC Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 406. GCC Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21. Motion Positioning Stages Market, by Country

[illegible] A stage supplier should establish the solicitation's governing provisions and the offered end product's origin before selecting a direct or reseller bid route. A domestic sales office is not a substitute for the required product-origin determination; these federal rules should not be generalized to private Manufacturing buyers.

[illegible] A stage supplier can assess a shared documentation route where its offering qualifies, but should not treat UKCA alone as an EU passport. Product classification, importer responsibility, and the actual destination must be settled before consolidating documentation or channel arrangements.

Saudi Arabia distinguishes an industrial or institutional import route from consumer retail distribution. [illegible] The service description does not establish that every stage requires the same certificate, that a particular application will be approved, or that a foreign conformity mark removes Saudi documentation obligations.

China's domestic-product framework for government procurement applies from January xx.xx 2026. [illegible] Local production can change the origin proposition but does not guarantee procurement qualification or an award.

India's public purchasing framework makes local resale and local content different commercial propositions. DPIIT's 2024-2025 annual report excludes locally sourced imported goods from local-content calculations, requires origin documentation for reseller offers, and distinguishes local-supplier eligibility from global bidding. [illegible]

Figure 36. Global Motion Positioning Stages Market Size, by Country, 2025 vs 2032 (%)

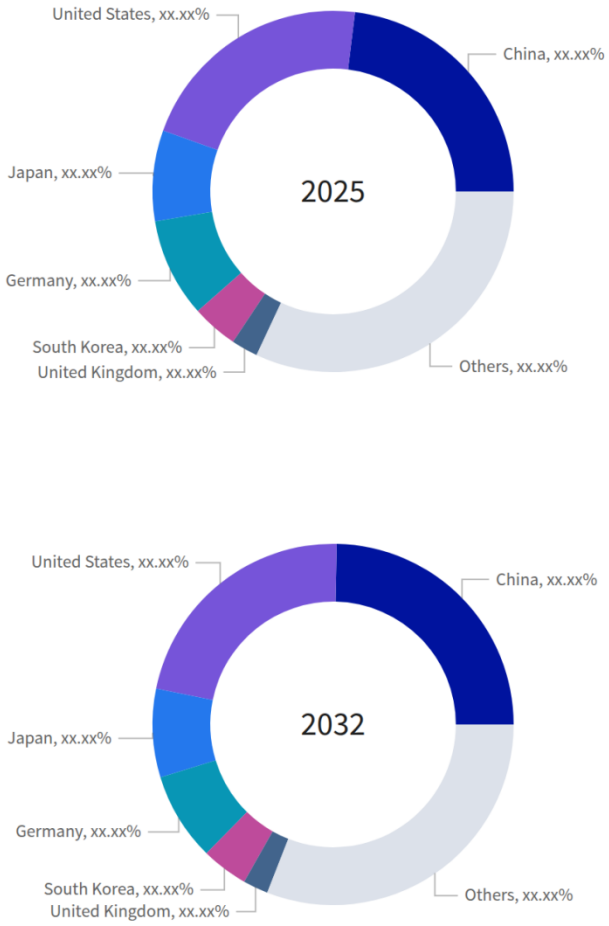


Figure 37. Global Motion Positioning Stages Market Size, by Country, 2025 vs 2026 vs 2032

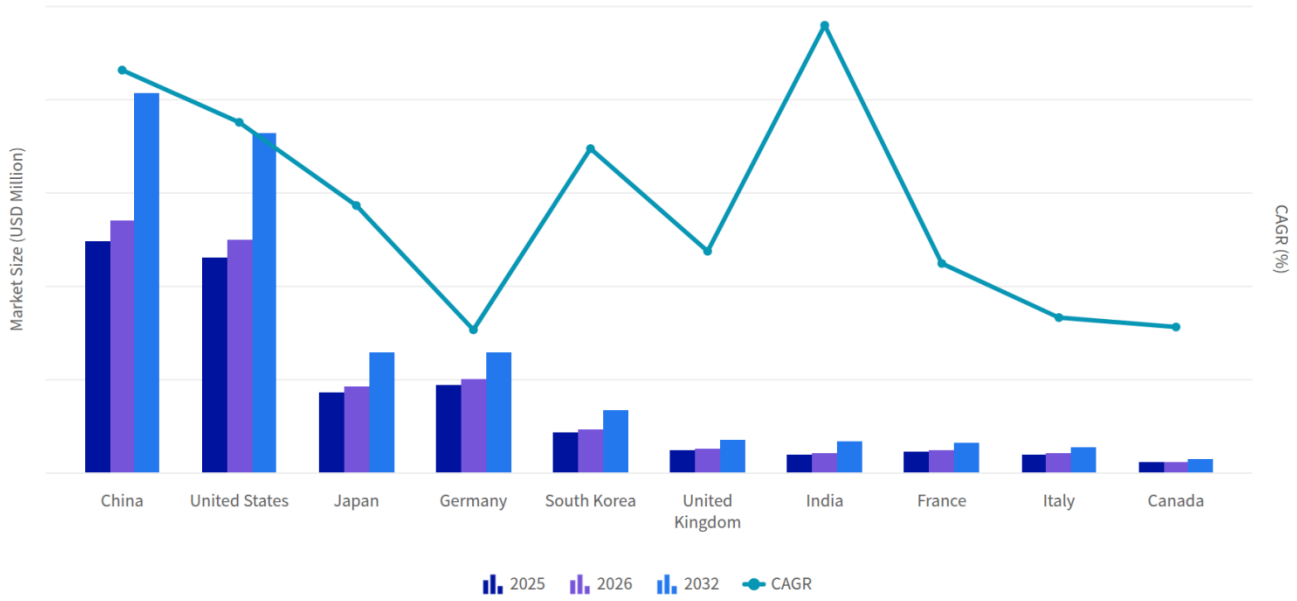


Table 407. Global Motion Positioning Stages Market, by Country growth contribution, 2025-2032

Category	2025 value (USD Million)	2032 value (USD Million)	Added value (USD Million)	2025 share (%)	2032 share (%)	Change (pp)	Growth share (%)	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Unallocated / remaining scope	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Scope total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 408. Global Motion Positioning Stages Market Size, by Country, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Brazil	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Canada	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
China	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
France	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Germany	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
India	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Italy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Japan	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mexico	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Russia	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
South Korea	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Spain	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United Kingdom	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
United States	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Issuing a Shipment Certificate for Imported Products (Products Are Not for Direct Marketing to the Consumer)
   · SASO describes a shipment-certificate service for products not directly marketed to consumers, with government-entity and importer submissions requiring product and shipping documentation. ([saso.gov.sa](https://www.saso.gov.sa/en/eservices/pages/details.aspx?serviceid=xx.xx&utm_source=openai))
2. Department for Promotion of Industry and Internal Trade - Annual Report 2024-2025
   · DPIIT's 2024-2025 report excludes locally sourced imports from local-content calculations, requires origin documentation for reseller offers, and distinguishes local-supplier eligibility from global bidding. ([dpiit.gov.in](https://www.dpiit.gov.in/static/uploads/2025/xx.xx/e266b2694ebc0cbfa72a929e22790301.pdf))
3. Part 25 - Foreign Acquisition | Acquisition.GOV
   · FAR Part xx.xx distinguishes Buy American and trade-agreement origin tests and provides nondiscriminatory treatment for eligible foreign products in covered acquisitions. ([acquisition.gov](https://www.acquisition.gov/far/part-xx.xx))
4. Supply of Machinery (Safety) Regulations 2008: Great Britain
   · UK machinery guidance permits continued CE recognition alongside UKCA in Great Britain under applicable conditions and distinguishes Northern Ireland and EEA requirements. ([gov.uk](https://www.gov.uk/government/publications/supply-of-machinery-safety-regulations-2008/supply-of-machinery-safety-regulations-2008-great-britain))

5. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见

   · China's joint ministry guidance requires implementation from January xx.xx 2026, domestic production, scrutiny of supplier declarations, and equal treatment for qualifying foreign-invested products. ([m.mof.gov.cn](https://m.mof.gov.cn/zcfb/xx.xx/t20251219_3979568.htm))

   · Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.

6. ISRO - LEOS Public Tender Notice 06/2025-26

   · ISRO's 2025 notice identifies an Ultra High Vacuum compatible motorized modular Linear XY-Translation Stage and accessories as a procurement requirement, not an award or foreign-bidder eligibility determination. ([isro.gov.in](https://www.isro.gov.in/media_isro/pdf/Tenders/2025/LEOSPT062025-26_02072025.pdf))

7. Positioning 2026 Business Report - HOERBIGER

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.

   · Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.

8. MKS Inc. Annual Report 2025

   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

9. SIGMAKOKI Integrated Report 2025

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.

   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.

   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.

10. MISUMI Integrated Report 2025 - Business Portfolio

    · Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.

11. Festo Sustainability Report 2025 - Festo at a Glance

    · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.

12. Festo startet optimistisch ins Jubiläumsjahr

    · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.

    · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.

13. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
14. Aerotech Recruiting FAQs
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
15. Novanta Announces Agreement to Acquire Motion Solutions
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
16. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.
17. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
18. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally
    - Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
19. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.

20. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
21. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
22. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.
23. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
24. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
25. MISUMI Expands Automated Positioning Stage Production for Data Centers
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
26. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
27. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

28. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

29. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.

21.1. China

Table 409. China Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
China	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 410. China Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 411. China Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 412. China Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 413. China Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 414. China Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 415. China Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 416. China Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 417. China Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 418. China Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 419. China Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 420. China Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 421. China Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 422. China Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Chinese equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. 关于贯彻落实《国务院办公厅关于在政府采购中实施本国产品标准及相关政策的通知》的意见
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The notice implements domestic-product procurement requirements from January xx.xx 2026, with declarations and equal treatment of qualifying foreign-invested products; it does not quantify stage demand or imported-stage eligibility.
23. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
24. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.

25. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
26. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.

27. G-RST Family - Two-Axis Gimbal Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

28. 40mm, English Micrometer Tilt Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.

29. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.

30. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.

31. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
32. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
33. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
34. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
35. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
36. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
37. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.

38. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
39. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.
40. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
41. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

42. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

43. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

44. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

45. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

46. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

47. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

48. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

49. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

50. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

51. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

52. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
53. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
54. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
55. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
56. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

57. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

58. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

59. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

60. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

61. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

62. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

63. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

64. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
65. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
66. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
67. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

68. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
69. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
70. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
71. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
72. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

73. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
74. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
75. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

76. Orders, Shipping & Warranties

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.

77. AlgaPro TE300 AI Phytoplankton Monitoring

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.

78. Novanta Inc. - 2024 Annual Report

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.

79. KAP Consulting - Motion Control Sales & Integration

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

80. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

81. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

82. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

83. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
84. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
85. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
86. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
87. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

88. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

89. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

90. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

91. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

92. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

93. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

94. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
95. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
96. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
97. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

98. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

99. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

100. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

101. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

102. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

103. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

104. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.2. United States

Table 423. United States Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
United States	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 424. United States Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 425. United States Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 426. United States Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 427. United States Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 428. United States Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 429. United States Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 430. United States Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 431. United States Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 432. United States Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 433. United States Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 434. United States Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 435. United States Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 436. United States Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier disclosed xx.xx% US sales; its diversified portfolio prevents direct use as stage-market allocation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641113.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.
89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.3. Germany

Table 437. Germany Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Germany	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 438. Germany Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 439. Germany Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 440. Germany Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 441. Germany Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 442. Germany Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 443. Germany Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 444. Germany Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 445. Germany Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 446. Germany Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 447. Germany Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 448. Germany Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 449. Germany Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 450. Germany Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_2016623164113.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.4. Japan

Table 451. Japan Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Japan	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 452. Japan Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 453. Japan Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 454. Japan Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 455. Japan Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 456. Japan Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 457. Japan Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 458. Japan Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 459. Japan Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 460. Japan Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 461. Japan Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 462. Japan Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 463. Japan Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 464. Japan Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's xx.xx% Japanese sales mix is a commercial countercheck, not Japan's market share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.5. South Korea

Table 465. South Korea Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
South Korea	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 466. South Korea Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 467. South Korea Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 468. South Korea Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 469. South Korea Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 470. South Korea Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 471. South Korea Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 472. South Korea Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 473. South Korea Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 474. South Korea Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 475. South Korea Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 476. South Korea Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 477. South Korea Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 478. South Korea Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Korean equipment spending of USD xx.xx is a downstream commercial anchor, not stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.6. United Kingdom

Table 479. United Kingdom Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
United Kingdom	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 480. United Kingdom Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 481. United Kingdom Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 482. United Kingdom Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 483. United Kingdom Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 484. United Kingdom Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 485. United Kingdom Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 486. United Kingdom Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 487. United Kingdom Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 488. United Kingdom Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 489. United Kingdom Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 490. United Kingdom Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 491. United Kingdom Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 492. United Kingdom Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
58. X-LSQ075A Specifications - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.7. France

Table 493. France Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
France	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 494. France Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 495. France Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 496. France Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 497. France Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 498. France Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 499. France Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 500. France Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 501. France Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 502. France Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 503. France Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 504. France Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 505. France Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 506. France Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([[festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016)](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.8. Italy

Table 507. Italy Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Italy	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 508. Italy Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 509. Italy Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 510. Italy Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 511. Italy Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 512. Italy Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 513. Italy Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 514. Italy Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 515. Italy Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 516. Italy Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 517. Italy Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 518. Italy Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 519. Italy Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 520. Italy Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
· Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.9. India

Table 521. India Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
India	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 522. India Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 523. India Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 524. India Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 525. India Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 526. India Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 527. India Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 528. India Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 529. India Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 530. India Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 531. India Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 532. India Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 533. India Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 534. India Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.10. Canada

Table 535. Canada Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Canada	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 536. Canada Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 537. Canada Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 538. Canada Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 539. Canada Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 540. Canada Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 541. Canada Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 542. Canada Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 543. Canada Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 544. Canada Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 545. Canada Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 546. Canada Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 547. Canada Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 548. Canada Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.
57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.
58. X-LSQ075A Specifications - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))
59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.11. Mexico

Table 549. Mexico Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Mexico	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 550. Mexico Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 551. Mexico Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 552. Mexico Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 553. Mexico Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 554. Mexico Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 555. Mexico Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 556. Mexico Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 557. Mexico Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 558. Mexico Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 559. Mexico Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 560. Mexico Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 561. Mexico Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 562. Mexico Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Mexico's manufacturing composition and growth enter the North American country model, not the source's regional grouping.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.12. Russia

Table 563. Russia Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Russia	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 564. Russia Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 565. Russia Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 566. Russia Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 567. Russia Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 568. Russia Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 569. Russia Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 570. Russia Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 571. Russia Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 572. Russia Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 573. Russia Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 574. Russia Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 575. Russia Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 576. Russia Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.

40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.

76. AlgaPro TE300 AI Phytoplankton Monitoring

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.

77. Novanta Inc. - 2024 Annual Report

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.

78. KAP Consulting - Motion Control Sales & Integration

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.13. Spain

Table 577. Spain Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Spain	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 578. Spain Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 579. Spain Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 580. Spain Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 581. Spain Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 582. Spain Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Others	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 583. Spain Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 584. Spain Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 585. Spain Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 586. Spain Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 587. Spain Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 588. Spain Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 589. Spain Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 590. Spain Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Northern America and Europe, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.14. Brazil

Table 591. Brazil Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Brazil	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 592. Brazil Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 593. Brazil Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 594. Brazil Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 595. Brazil Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 596. Brazil Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 597. Brazil Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 598. Brazil Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 599. Brazil Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 600. Brazil Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 601. Brazil Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 602. Brazil Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 603. Brazil Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 604. Brazil Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares. ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Latin America and the Caribbean, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

21.15. Australia

Table 605. Australia Motion Positioning Stages Market Size, 2017-2040 (USD Million)

Country	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Australia	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 606. Australia Motion Positioning Stages Market Size, by Stage Configuration, 2017-2040 (USD Million)

Stage Configuration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Translation-Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Angular Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Multi-Axis Translation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Goniometer and Tilt Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Linear Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Axis Rotary Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 607. Australia Motion Positioning Stages Market Size, by Actuation Mode, 2017-2040 (USD Million)

Actuation Mode	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Drive-Ready Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Electrically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hydraulically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manual Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Actuation Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Pneumatically Actuated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 608. Australia Motion Positioning Stages Market Size, by Drive Mechanism, 2017-2040 (USD Million)

Drive Mechanism	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Belt and Cable Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Cam, Wedge, and Linkage Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Electromagnetic Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Direct Piezoelectric Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Fluid-Pressure Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Friction-Roller Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Hybrid and Mixed Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rack-and-Pinion Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Rotary Gear Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Screw Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Installed Drive Mechanisms	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 609. Australia Motion Positioning Stages Market Size, by Direct Piezoelectric Drives, 2017-2040 (USD Million)

Direct Piezoelectric Drives	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Piezoelectric Deformation Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Piezoelectric Motor Drives	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 610. Australia Motion Positioning Stages Market Size, by Guidance Technology, 2017-2040 (USD Million)

Guidance Technology	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Air-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Ball-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Flexure-Guided Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Liquid-Hydrostatic-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Magnetically Levitated Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Guidance Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Roller-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Sliding-Bearing Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 611. Australia Motion Positioning Stages Market Size, by Feedback Architecture, 2017-2040 (USD Million)

Feedback Architecture	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Actuator-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Dual-Position-Feedback Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Load-Side Closed-Loop Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Mixed-Feedback Systems	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Open-Loop and Non-Servo Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 612. Australia Motion Positioning Stages Market Size, by Application, 2017-2040 (USD Million)

Application	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Alignment & Coupling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Assembly & Precision Handling	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Imaging & Microscopy	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Material Processing & Patterning	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Metrology, Calibration & Inspection	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Testing & Characterization	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 613. Australia Motion Positioning Stages Market Size, by End-User Sector, 2017-2040 (USD Million)

End-User Sector	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Education	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Healthcare Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Manufacturing	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Public Administration & Defense	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Research & Technical Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Utilities & Environmental Services	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 614. Australia Motion Positioning Stages Market Size, by Purchasing Role, 2017-2040 (USD Million)

Purchasing Role	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Operators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Equipment OEMs	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Independent System Integrators	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 615. Australia Motion Positioning Stages Market Size, by Control Integration, 2017-2040 (USD Million)

Control Integration	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined Onboard and External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
External Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Onboard Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Stages Without Control Electronics	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 616. Australia Motion Positioning Stages Market Size, by Customization Level, 2017-2040 (USD Million)

Customization Level	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Configured-to-Order Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Custom-Engineered Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard Catalog Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 617. Australia Motion Positioning Stages Market Size, by Sales Channel, 2017-2040 (USD Million)

Sales Channel	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Direct Manufacturer Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Distributor and Reseller Sales	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Table 618. Australia Motion Positioning Stages Market Size, by Operating Environment, 2017-2040 (USD Million)

Operating Environment	2017	2024	2025	2026	2027	2032	2040	CAGR (%)
Combined-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Single-Environment Qualified Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Standard-Environment Stages	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx	xx.xx
Total	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**	**xx.xx**

Sources & Evidence

1. Positioning 2026 Business Report - HOERBIGER

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2024, providing a comparable supplier-level historical constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: PI reported EUR xx.xx sales in 2025 and approximately 1,900 employees. These constrain the modeled stage attribution and revenue-per-employee calibration, not the global market directly.
- Evidence informing the 2026 market-value input; displayed series and growth include calculations: PI targeted high-single-digit growth for 2026. This is corporate guidance used as an outlook constraint, not realized revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx sales in 2025 versus EUR xx.xx in 2024. This constrains the inherited PI stage pool and challenges rapid uniform growth; it does not disclose screw-stage revenue. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same company-level revenue is a scale constraint for the modeled electromagnetic allocation, not a reported mechanism share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The company total bounds the assumed finished piezo-stage contribution after inherited non-stage exclusions; no piezo-stage split is reported. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's company revenue constrains the modeled hybrid contribution within its scoped stage pool; the hybrid fraction remains assumed. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI reported EUR xx.xx corporate sales in 2025 versus EUR xx.xx in 2024, constraining the inherited PI revenue pool but not directly verifying stage attribution or guidance mix.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Weak 2025 supplier performance and a high-single-digit corporate growth objective for 2026 temper uniform transmission of equipment-cycle growth into the modeled precision-stage mix.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 sales versus EUR xx.xx in 2024 and reported automation weakness challenge uniform equipment-cycle pass-through.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported reductions in publicly funded projects qualify assumptions of rapid research-related demand growth; no stage-only sector split is disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported public-project weakness supports a restrained scientific-demand trajectory rather than an automatic institutional purchasing uplift.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI's EUR xx.xx 2025 corporate sales constrain the inherited specialty-supplier value pool, not a disclosed catalog-stage share. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2024-2025 corporate sales comparison provides a restraint on assuming uniform rapid conversion of equipment demand into configured-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Sales increased

2. MKS Inc. Annual Report 2025
   - Evidence informing the 2024 market-value input; displayed series and growth include calculations: MKS reported 2024 Photonics Solutions Division revenue of USD xx.xx, providing a broader-business comparison.
   - Evidence informing the 2025 market-value input; displayed series and growth include calculations: MKS reported 2025 Photonics Solutions Division product revenue of USD xx.xx and total division revenue of USD xx.xx. Only an assumed stage-attributable fraction of product revenue enters the model.

3. SIGMAKOKI Integrated Report 2025

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: For the year ended May 2025, SIGMAKOKI disclosed JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. The model separates attributable stages from holders, controls and unrelated products.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: Consolidated sales of JPY xx.xx and xx.xx employees provide a commercial revenue-per-employee calibration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY-May-2025 optical-basic-equipment sales of JPY xx.xx and automatic-applied-product sales of JPY xx.xx support the scoped manual/automatic monetary proxy after explicit stage-attribution assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The corresponding FY2024 amounts, JPY xx.xx and JPY xx.xx, provide counterevidence to uniform electrical substitution; they do not directly establish future shares.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Automatic-applied-product revenue supplies the electrical side of the scoped optical-catalog value proxy, subject to inherited exclusions for controls and unrelated products.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The fiscal decline in the automatic product pool qualifies the forecast's electrical-growth assumption rather than directly verifying it.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May-2025 report identifies JPY xx.xx optical-basic-equipment sales and JPY xx.xx automatic-applied-product sales. Inherited stage exclusions and currency conversion constrain the optical/catalog pool, not an observed screw mix. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual/basic and automated product revenue pools provide monetary context for optical-stage demand; the rotary-gear attribution remains a modeled portion. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The FY2025 report's xx.xx% standalone-company special-product share informs, but does not directly establish, the stage-specific catalog complement. ([sigma-koki.com](https://www.sigma-koki.com/asset/data/Integrated-Report-2025.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The special-product disclosure is a calibration input requiring an assumed split between predefined configuration and new engineering.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The reported special-product ratio is broader than stage-only custom engineering; the modeled bridge explicitly avoids equating them.

4. MISUMI Integrated Report 2025 - Business Portfolio

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: MISUMI disclosed JPY xx.xx FA Business sales for FY2024 and distinguished manufacturing from VONA distribution. A modeled stage fraction and reporting-period bridge are applied only to the manufacturing pool.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales were JPY xx.xx; the report distinguishes manufacturing from VONA distribution. The frozen scoped stage contribution enters the industrial monetary pool, not the entire FA turnover. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing/distribution distinction supports excluding resale duplication from the common industrial-stage pool used for the modeled belt allocation. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 FA manufacturing sales of JPY xx.xx constrain an inherited supplier pool; VONA distribution is separately identified and excluded from additive resale value. ([misumi.co.jp](https://www.misumi.co.jp/sites/default/files/2026-xx.xx/MISUMI_Integrated_Report_2025_English_16-xx.xx.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports the value-chain boundary of the configurable industrial supplier pool, not a customization percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The financial pool requires inherited stage attribution before customization allocation; total FA sales are not treated as custom-stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The report identifies JPY xx.xx FA manufacturing revenue and distinguishes manufacturing from VONA distribution. This supports the manufacturing-only weight used in the joint channel model.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturing-versus-distribution distinction supports excluding third-party resale turnover from the market denominator while attributing independently manufactured stages to their actual selling route.

5. Festo Sustainability Report 2025 - Festo at a Glance
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2025. This is a diversified supplier ceiling to which an explicitly assumed complete-stage fraction is applied.
   · Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo reported EUR xx.xx revenue in 2025 and identifies pneumatic and electric automation businesses. Only the inherited scoped stage contribution enters the model; the fluid-pressure fraction of that pool is assumed. ([festo.com](https://www.festo.com/PDF_Flip/corp/Festo_Sustainability_Report_2025/en/xx.xx-xx.xx/index.html))
6. Festo startet optimistisch ins Jubiläumsjahr
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: Festo reported EUR xx.xx sales in 2024, down xx.xx%, providing counterevidence to uniform automation-market expansion.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2024 revenue provides the comparison for assessing Festo's weaker 2025 euro-denominated sales.
7. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: THK reported JPY xx.xx industrial-machinery revenue in 2025. Only an assumed complete-stage portion is included; component and other business revenue is excluded.
8. Aerotech Recruiting FAQs
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Aerotech's December 2025 recruiting material states that it has more than xx.xx employees worldwide and distinguishes positioning products from complete automation machines. The model uses xx.xx employees conservatively, with assumed commercial revenue intensity and stage attribution.
9. Novanta Announces Agreement to Acquire Motion Solutions
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: Novanta expected Motion Solutions to generate approximately USD xx.xx revenue in 2023. This historical corporate expectation is bridged to 2025 with assumed growth and stage attribution; it is not treated as audited realized revenue.
10. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
   · Evidence informing the 2024 market-value input; displayed series and growth include calculations: The 2024 annual-average EUR conversion of USD xx.xx per EUR supports comparison of euro-denominated supplier activity.
   · Evidence informing the 2025 market-value input; displayed series and growth include calculations: The 2025 annual averages are USD xx.xx per EUR and JPY xx.xx per USD. These are used for the base-year monetary conversions.

11. SEMI Reports Global Semiconductor Equipment Billings Reached USD 135 Billion in 2025

- Evidence informing the 2024 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2024, providing an independent downstream equipment-activity constraint.
- Evidence informing the 2025 market-value input; displayed series and growth include calculations: SEMI reported USD xx.xx semiconductor-equipment sales in 2025, compiled from member submissions with SEAJ. This supports a merchant-stage-content cross-check, not substitution of whole-equipment sales for stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Association-reported 2025 semiconductor-equipment billings of USD xx.xx anchor the shared semiconductor purchasing proxy; modeled stage content and configuration attribution are separate assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor-equipment activity anchor constrains the common pool from which the rotary value weight is modeled; it does not disclose rotary-stage sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The common semiconductor purchasing proxy supports the denominator bridge for modeled goniometer/tilt allocation, not a directly observed configuration percentage.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment billings constrain semiconductor-related merchant-stage demand used in the translation-package model; complete-machine value is not counted as stage revenue.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The shared equipment-activity anchor supports the semiconductor pool underlying the modeled angular-package allocation, with incidence and realization left explicitly assumed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The semiconductor activity pool constrains combined-stage demand attribution; externally purchased stage content and combined-package incidence are modeled rather than disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx of 2025 semiconductor-equipment billings anchors the semiconductor-demand proxy, subject to the explicitly assumed merchant-stage content. It is not stage revenue. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The observed equipment-billings pool constrains the common semiconductor-demand weight; actuator-side attribution is modeled separately. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The equipment-billings anchor supports the common demand denominator, not a directly reported load-side stage share. ([semi.org](https://www.semi.org/en/SEMI-Reports-Global-Semiconductor-Equipment-Billings-Reached-xx.xx-Billion-in-2025))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The common

12. IFR World Robotics 2026 - Five Million Robots Now Operate in Factories Globally

- Evidence informing the 2025 market-value input; displayed series and growth include calculations: IFR's September xx.xx 2026 release reports more than xx.xx industrial-robot installations in 2025, up xx.xx%. The model uses xx.xx as a rounded automation-activity benchmark, not as stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the inherited general-automation activity benchmark, not a count of linear stages.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The automation activity benchmark constrains the industrial purchasing pool used for modeled rotary-stage value attribution.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial pool uses installation activity only as a commercial proxy; the goniometer/tilt incidence is an explicit assumption.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial automation activity supports the common purchasing-pool bridge for translation packages, without equating robot purchases to stage shipments.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial activity benchmark constrains the purchasing pool, while angular-package incidence and realizations remain modeled.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Installation activity supports the general-industrial demand bridge, not an observed combined-stage attachment rate or future configuration share.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx industrial-robot installations in 2025 support the rounded automation-activity benchmark, not observed stage shipments.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The installations benchmark constrains industrial activity; stage attachment, price and actuator-feedback purchasing mix are modeled. ([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The shared industrial-demand input is an activity proxy, with load-side package attribution applied separately.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Industrial installations support the common demand-scale bridge, not an observed dual-position stage penetration rate.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The activity benchmark supports the industrial cohort; complete mixed-stage package counts remain assumption-led.
([ifr.org](https://ifr.org/ifr-press-releases/news/five-million-robots-now-operate-in-factories-globally))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: More than xx.xx robot installations in 2025 constrain the industrial activity scale; alignment attachments are assumed.

13. World Robotics 2025 Industrial Robots - Executive Summary
    - Evidence informing the 2017 market-value input; displayed series and growth include calculations: The historical installations chart supplies an automation-activity reference for the backcast starting point.
    - Evidence informing the 2018 market-value input; displayed series and growth include calculations: The historical chart supports expansion before the subsequent industrial downturn.
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: The historical chart supports weaker industrial activity during the 2019 downturn.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: Historical installations constrain the automation component without equating robot purchases with stage purchases.
    - Evidence informing the 2024 market-value input; displayed series and growth include calculations: IFR reported xx.xx installations in 2024, versus xx.xx in 2023 and xx.xx in 2022.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: 2024 customer-industry counts constrain the manufacturing versus non-manufacturing industrial-pool bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed technical-service routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed educational routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed healthcare routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed government routing.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Customer-industry counts constrain the non-manufacturing portion before assumed utility routing.
14. SEMI Release: 2020 Global Semiconductor Equipment Sales Surge 19% to USD 71.2 Billion
    - Evidence informing the 2019 market-value input; displayed series and growth include calculations: SEMI's published release reports USD xx.xx semiconductor-equipment sales in 2019.
    - Evidence informing the 2020 market-value input; displayed series and growth include calculations: SEMI reported equipment sales rising xx.xx% to USD xx.xx in 2020, constraining the semiconductor component of the historical bridge.
15. 2021 Global Semiconductor Equipment Sales Surge 44% to USD 102.6 Billion - SEMI
    - Evidence informing the 2021 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment sales increasing xx.xx% to USD xx.xx in 2021. The stage model applies a substantially attenuated rebound.
16. Global Semiconductor Equipment Billings Reach USD 107.6 Billion in 2022 - SEMI
    - Evidence informing the 2022 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings of USD xx.xx in 2022, supporting continued but slower equipment demand.

17. Global Semiconductor Equipment Billings Slip to USD 106.3 Billion in 2023 - SEMI
    - Evidence informing the 2023 market-value input; displayed series and growth include calculations: SEMI reported semiconductor-equipment billings falling to USD xx.xx in 2023, constraining the modeled correction.
18. Global Semiconductor Equipment Sales Forecast to Reach USD 229 Billion in 2028 - SEMI
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July 2026 association forecast projects xx.xx% wafer-fab-equipment growth in 2026; the model applies a lower merchant-stage response.
    - Evidence informing the 2027 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2027, supporting the near-term demand driver rather than a directly observed stage forecast.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The association projects xx.xx% wafer-fab-equipment growth in 2028, supporting moderation of the semiconductor-related driver.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SEMI's July xx.xx 2026 supplier-input forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, constraining the precision-equipment demand premise. The modeled roller-stage rate is separate and substantially attenuated.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The association's equipment outlook provides an external downstream demand signal for precision alignment and inspection purchases, not a published flexure-stage share or adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment expansion forecast constrains the high-precision purchasing premise used for air-bearing stages; equipment sales are not substituted for externally sold stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Projected 2026-2028 wafer-fab-equipment growth constrains the faster semiconductor-exposed forecast component; the merchant-stage response is assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the research-sector forecast, not an observed future sector share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment growth informs the semiconductor-exposed portion of the education forecast, not an observed future purchasing mix.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 association forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% in 2026-2028, supporting the inherited attenuated semiconductor demand driver rather than directly forecasting environmental shares.
      ([semi.org](https://www.semi.org/en/semi-press-release/global-semiconductor-equipment-sales-forecast-to-reach-a-record-xx.xx-billion-dollars-in-2028-semi-reports?trk=article-ssr-frontend-pulse_little-text-block))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differential semiconductor demand growth changes the forecast allocation through the base environmental model; its stage-response coefficient remains assumed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The forecast activity signal supports the relative-demand bridge, not a measured increase in combined-environment adoption or pricing.

19. MISUMI Expands Automated Positioning Stage Production for Data Centers

- Evidence informing the 2026 market-value input; displayed series and growth include calculations: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment to double automated-positioning-stage supply capacity. Investment and capacity are not counted as stage sales.
- Evidence informing the 2028 market-value input; displayed series and growth include calculations: The announced expansion supports a conditional supply-response premise for the medium-term forecast, not proof of utilization or completed sales.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 automated-stage investment announcement supports a conditional supply response and cautions against assigning all automation expansion to integrated multi-axis packages.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support available automated-stage supply, not realized translation-package sales or a measured adoption increment.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reported optical-transceiver equipment demand is a conditional commercial signal for alignment-stage purchasing; the announcement does not identify the combined-stage revenue share.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January xx.xx 2026 announcement describes approximately JPY xx.xx planned investment to double automated-stage supply capacity. It supports an expansion premise, not a screw-specific sales forecast. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement is a common automated-stage demand and supply signal; the electromagnetic relative-growth assumption is separately modeled and is not disclosed by the source. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Planned capacity is not counted as realized revenue or allocated automatically to piezoelectric stages; it supplies only a shared conditional expansion premise. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-capacity announcement supports the broader equipment-expansion scenario but does not verify hybrid adoption, utilization or the modeled hybrid share increase. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's January xx.xx 2026 announcement identifies approximately JPY xx.xx planned investment, doubled automated-stage supply capacity and rising optical-transceiver-related orders. This supports a conditional OEM-stage demand premise, not realized guidance-specific revenue.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The stage-specific capacity and order announcement supports the forecast's rolling-stage purchasing premise when combined with independently documented crossed-roller offerings; it does not disclose the roller share of that expansion.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announced automated-stage capacity expansion supports an automation supply-response scenario, but does not prove displacement of open/non-servo purchases. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately JPY xx.xx planned investment and intended capacity doubling support commercial expansion, not actuator-feedback-specific adoption or realized sales. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier announcement supports the conditional automation-demand premise; it does not disclose load-feedback orders or validate the modeled mix shift. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Capacity plans constrain the commercial supply-response premise, while dual-position configuration prevalence remains an explicit forecast assumption. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The investment announcement supports broader automated-stage activity, not observed mixed-feedback package revenue or future utilization. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The January

20. MISUMI - Increased Production of Automated Stages for Data Centers and Components for Growth Industries
    - Evidence informing the 2026 market-value input; displayed series and growth include calculations: The July xx.xx 2026 announcement describes approximately JPY xx.xx broader investment covering automated stages and other growth-industry components. Its entire amount is not attributed to stages or added to realized revenue.
    - Evidence informing the 2028 market-value input; displayed series and growth include calculations: The updated investment announcement strengthens the conditional capacity-expansion premise while leaving delivery, utilization and product-mix uncertainty unresolved.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July xx.xx 2026 announcement describes JPY xx.xx of broader expansion investment and planned automatic-stage capacity approximately three times FY2025, supporting a conditional automation supply-response premise, not realized revenue or the forecast percentage.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Expansion of automatic-stage supply supports the broader industrial positioning activity premise, while its motor-installed versus motorless revenue attribution remains an explicit forecast assumption.
21. UNIDO - Factsheet: Asia and Oceania, International Yearbook of Industrial Statistics 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: National industrial-input proxy.
22. LSM Family - Compact, Screw Drive Linear Stage - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current North American direct X-LSM prices of USD xx.xx-xx.xx constrain standard controlled linear-stage realizations; they are relative-price proxies, not observed global 2025 ASPs or future sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Public direct stage prices constrain package-price plausibility, not alignment purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Single-axis and multi-axis list prices provide a commercial range for the assumed processing-stage package realization.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Standard LSM direct prices include USD xx.xx-xx.xx with multi-axis packages priced higher; global manufacturer realizations remain modeled.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-priced multi-axis offerings constrain the scientific-testing package assumption without establishing its frequency.
23. RSM Family - Rotary Stages, Vacuum Compatible Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current X-RSM prices of USD xx.xx-xx.xx and higher-priced vacuum variants constrain the rotary realization range. Controller and environmental variants prevent assuming one universal rotary ASP.
24. X-GSM-E Motorized Goniometer and Tilting Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-GSM-E goniometers are listed at USD xx.xx with built-in controls, providing a standard motorized goniometer price anchor rather than a global sales weight.

25. ASR Family - Motorized XY Microscope Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The XY microscope-stage family offers motor-only and controlled packages; X-ASR prices are USD xx.xx-xx.xx. This supports the integrated translation-package category and its relative realization assumptions, not observed adoption.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ASR motor-only and built-in-controller packages both contain stepper motors, supporting electrical classification regardless of controller inclusion.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current North American direct entry prices distinguish package scope but are not used as 2025 realized prices or a universal controller premium.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: A motor-only package is not motorless; the family provides a commercial counterexample to equating absent control electronics with Drive-Ready stages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage direct prices span USD xx.xx-xx.xx across the family; controller alternatives and software support establish package differences, not observed buyer mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Current microscopy-stage packages and North American direct prices provide a limited price-scale check for the industrial pool's relative-value bridge, not observed sector prices.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy-stage price ranges and alternative control packages inform a bounded non-manufacturing relative-price assumption, not research sales.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Catalog packages provide a commercial price reference, not measured institutional preferences or academic purchasing volumes.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Microscopy compatibility establishes an offering context, not provider adoption, clinical acceptance or healthcare-stage revenue.
26. G-RST Family - Two-Axis Gimbal Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Two-axis gimbal stages have current direct price ranges of USD xx.xx-xx.xx and USD xx.xx-xx.xx constraining the higher-value angular-package range without establishing shipment incidence.

27. 40mm, English Micrometer Tilt Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manual two-axis tip-tilt stage is listed at USD xx.xx for quantities one to two and USD xx.xx for three or more, demonstrating lower-cost angular packages and quantity-price variation.
28. H-840 Hexapod 6-Axis Positioning System - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The H-xx.xx is a marketed positioning assembly combining three translational and three rotational axes. It supports combined-stage classification and package scope, but publishes neither attributable category revenue nor a realized price.
29. Global Tender for a Manual Waveguide Alignment Rig - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 tender requests a manual common-base arrangement containing XYZ units and central linear/rotational positioning. It supports inclusion of manual combined offerings, not an award, current revenue or a sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The October xx.xx 2022 manual-stage procurement specification includes digital position readout, supporting classification without equating readout with servo control. No award value is disclosed. ([iisc.ac.in](https://iisc.ac.in/wp-content/uploads/2022/xx.xx/waveguide-allignment-rig.pdf))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The dated institutional tender establishes manual alignment-stage procurement eligibility and support obligations; it supplies no award value or global sales weight.
30. DMA - XYZ Stage Configurator - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The USD xx.xx XYZ configuration includes individually packaged stages requiring assembly, supporting the distinction between separately supplied axes and a delivered multi-axis assembly.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The configurator is counterevidence to treating every multi-axis catalog bundle as an assembled translation-stage sale; its price is not used as an observed complete-assembly realization.

31. Linear Stages - High Accuracy Motorized Translation Stages - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies motor-driven precision stages and electrically driven air-bearing stages, supporting the precision-pool classification premise but not its assumed sales fractions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Air-bearing guidance on a motor-driven stage does not establish pneumatic actuation, preventing high-value precision stages from being allocated solely by bearing terminology.
32. Electric Actuators - Controllers/Drivers, P-E20-1 - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists motor-driven slide and rotary tables, supporting electrical-stage participation within its scoped stage budget; the document does not disclose sales mix.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog separately identifies motorless slider variants, supporting Drive-Ready classification even when the supplier places them within an electric-actuator catalog.
33. Air Slide Table MXQ Series - SMC
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC's MXQ commercial page identifies an air slide table, supporting a qualifying complete-stage product category within the modeled pneumatic supplier pool, not a published revenue percentage.
34. Electromechanical Actuators - Festo
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo distinguishes electric axes and complete units including motors and servo drives, supporting configuration-sensitive electrical attribution rather than counting every mechanical axis as motor-equipped.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The distinction between mechanical-axis offerings and integrated complete solutions supports a separate modeled Drive-Ready exposure; no shipment split is disclosed.
35. Simple Electric Automation Solution - Festo USA
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo describes integrated electric motion offerings and their commercial positioning against pneumatic alternatives, supporting a conditional substitution mechanism rather than a measured adoption rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo retains pneumatic positioning for simple movements and identifies upfront-cost trade-offs, supporting continued pneumatic activity rather than complete displacement.
36. Motorless Stages: Z-Axis Level Cross Roller Guide - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motorless-stage catalog establishes a complete stage offered without an installed motor and states catalog-specific customer-installation guarantee limitations; it supports classification and integration-risk context, not the modeled global share.
37. Global Tender for Supply and Installation of Piezo Actuated Linear XYZ Stage with Full Assembly - Indian Institute of Science
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The November xx.xx 2025 tender requests two multi-axis assemblies combining powered and manual positioning, supporting the existence of a mixed-actuation purchasing configuration; no award or realized purchase value is established.
38. Rotary Indexing Table - Air-Hydraulics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer brochure identifies pneumatic rotary indexing tables and electrical sensing, supporting motive-power classification independently of sensing electronics.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The brochure lists hydraulic-powered indexing for Model xx.xx supporting a commercially identified hydraulic-stage option but not its realized sales or global penetration.

39. Linear Translation Stages and NanoPositioners Overview - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies ball-screw stage offerings, supporting installed screw-drive classification rather than classification solely by the motor. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The portfolio separately identifies piezo-actuator and piezo-motor stages; it establishes category mapping, not their sales weights. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Actuator-driven flexure-stage offerings support the deformation subtype boundary. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Named piezo-motor stages support a separate motor subtype without measuring its conditional share. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: M-xx.xx is identified as a hybrid piezo/servo-motor stage, supporting the mixed-actuation attribution premise. ([pi-usa.us](https://www.pi-usa.us/en/products/linear-stage-precision-positioners-overview))
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI identifies crossed-roller-guided stages separately from their servo, stepper, screw and piezo drive options, supporting the model's roller-guidance mapping independently of actuation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly identifies flexure-guided NanoCube and other nanopositioning products, supporting flexure exposure in precision and scientific-stage pools without providing a sales fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI separately describes magnetic-linear-motor stages with air-bearing guidance, supporting air-guidance classification without equating guidance with motive drive.
40. X-LSQ-E Closed-Loop Motorized Linear Stages - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-LSQ-E page identifies lead-screw variants and a current USD xx.xx starting price for xx.xx-mm models. It supplies a direct North American asking-price comparison, not a 2025 realized global average. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ-E))

41. X-LDQ-AE Precision Linear Motor Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LDQ-AE is identified as a linear-motor stage; the current xx.xx-mm model starts at USD xx.xx. Its comparison with the screw-stage price challenges unit-weighted allocation but does not establish a universal premium. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The linear-encoder servo family lists USD xx.xx for its xx.xx mm package, anchoring the load-side reference before explicitly assumed forecast price compression. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The load-side package price supplies a commercial baseline for the dual-position basket; its additional USD xx.xx increment is an assumption, not this product's quote. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies the load-feedback constituent reference in the modeled mixed basket; the source does not establish mixed-package sales. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LDQ-AE))

42. 60mm Travel, X-Axis Rack & Pinion Stage - Edmund Optics

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The complete stage listing explicitly specifies rack-and-pinion drive and a current USD xx.xx single-unit asking price. It supports commercial mapping and low-priced catalog exposure, not market prevalence. ([edmundoptics.com](https://www.edmundoptics.com/p/60mm-travel-x-axis-rack-amp-pinion-stage/xx.xx?PrintPDF=true))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named dovetail rack-and-pinion stage is listed at USD xx.xx for quantities xx.xx-xx.xx. This current package price supplies an illustrative relative-value check, not a 2025 factory realization or observed category share.

43. RSM-E Motorized Rotation Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: RSM-E explicitly identifies worm gearing and a current complete-stage starting price of USD 2123. This supports geared rotary-stage classification, not a reported revenue share. ([zaber.com](https://www.zaber.com/products/rotary-stages/RSM-E))

44. LC40 Features - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: LC40 distinguishes a synchronous belt-equipped offering from a passive guide option. It supports the belt-led category proxy but does not establish cable-stage sales. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The passive option demonstrates why drive installation must be checked separately; a rail-only transaction is not automatically a complete unactuated stage in the modeled numerator. ([zaber.com](https://www.zaber.com/products/linear-stages/LC40/features))

45. Precision Slide Table with Recirculating Bearings - MXQ - SMC

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC identifies MXQ as a complete pneumatic precision slide table, supporting direct fluid-pressure stage classification. The page does not disclose stage revenue or the modeled supplier-pool mix. ([smcusa.com](https://www.smcusa.com/products/pneumatic-actuators/guided-actuators/slide-table/precision-slide-table-mxq-mxs/mxq~xx.xx))

46. IDL280-Z20 Industrial Vertical Stage - Newport, January 2026

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The January 2026 description identifies a finished vertical stage with a wedge arrangement and ball-screw drive. It supports compound-mechanism attribution, not 2025 sales or a published category share. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The compound arrangement supports excluding a single serial screw/wedge chain from an automatic hybrid classification; mixed independently actuated assemblies use a separate convention. ([newport.com](https://www.newport.com/mam/celum/celum_assets/resources/IDL280-Z20_-_User_s_Manual.pdf?xx.xx=))

47. Newport RSP Series Rotation Stages - Manufacturer Catalog Pages Hosted by Artisan Technology Group

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The identifiable Newport-authored interior catalog pages document friction-driven finished rotation stages. Only this historical manufacturer material is used; reseller inventory and used-equipment prices are excluded. Current roller-specific revenue remains unverified. ([artisantg.com](https://www.artisantg.com/info/Newport_RSP_2_Datasheet_20166231641l3.pdf))

48. New Focus/Newport Vacuum-Compatible Stainless-Steel Crossed-Roller-Bearing Translation Stages

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer catalog presents complete xx.xx/xx.xx translation-stage assemblies with actuators expressly excluded. This supports the complete-assembly boundary, not current availability or 2025 revenue volume. ([newport-japan.jp](https://www.newport-japan.jp/pdf/xx.xx.pdf))

49. Linear Actuator - THK Official Web Site

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: THK identifies KR/SKR as integrated LM-guide and ball-screw assemblies with ball-guided structures, supporting complete-stage mapping to the ball-bearing exposure of the automation cohort. The page does not disclose sales weights.

50. Mini slide DGST - Festo

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The DGST commercial datasheet distinguishes pneumatic actuation from ball-bearing guidance, supporting guidance-versus-drive independence and the automation cohort's ball-guided stage premise.

51. WEB Catalog - SMC CORPORATION
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC separately lists slide-bearing-guided offerings, supporting a sliding-guidance commercial exposure within automation rather than equating pneumatic actuation with one bearing class.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: SMC lists recirculating-linear-guided compact slides separately from crossed-roller products; this supports distinct guidance exposures, not their modeled sales percentages.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MXS and MXF listings explicitly identify cross-roller guidance, supporting roller-stage exposure within the automation commercial pool.
52. 25mm Travel, Metric Micrometer, Solid-Top Ball Bearing Stage - Edmund Optics
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The named ball-bearing micrometer stage is listed at USD xx.xx. Compared with the separately documented USD xx.xx dovetail package, it supplies a price-order check while differing size and configuration prevent treating the ratio as a guidance-only premium.
53. Oil Hydrostatic Linear Stages - ABTech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: ABTech advertises complete oil-hydrostatic linear stages as standalone or multi-axis offerings and separately describes pump units and integrated linear motors. This supports the niche's commercial boundary and package-valuation treatment, not its estimated revenue.
54. Magnetic Levitation Nanopositioning Stages: 6-DOF Comes Naturally - PI USA
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI explicitly labels its rotary, long-travel linear and AFM maglev platforms as technology demonstrators. This constrains the model against inferring PI standard-product revenue or automatic future commercialization.
55. Advanced Customized Motion Stages - Beijing U-Precision Tech Co., Ltd.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: U-Precision advertises advanced customized motion stages, distinguishes air-bearing and magnetic-bearing configurations, and describes application experience. This supplies a merchant custom-stage commercial lead, while current-year sales and complete-stage attribution remain unmeasured.

56. XYZ Stages - Multi-Axis Motorized 3-Axis Stage - PI USA

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI advertises the A-xx.xx hybrid gantry with air and mechanical linear bearings and an XYZ assembly combining air-bearing XY motion with mechanical Z motion. These complete-assembly examples support mixed-guidance classification, not a portfolio-count sales weight.

57. X-Axis Motorized Positioning Stages, Cross Roller Type - MISUMI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI's own named motorized positioning-stage listing identifies crossed-roller guidance, supporting the separate roller exposure assigned to its manufacturing-stage pool. The listing is not a revenue or shipment weight.

58. X-LSQ075A Specifications - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: X-LSQ075A lists USD xx.xx a built-in controller and no encoder. It anchors the powered non-servo package reference carried into the forecast model.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LSQ/specs?part=X-LSQ075A))

59. X-LRQ-E Motorized Linear Stages, Built-in Controllers & Motor Encoders - Zaber

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-encoder closed-loop family lists USD xx.xx for xx.xx mm configurations, anchoring the actuator-side relative-price reference; future prices remain modeled.
([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: USD xx.xx supplies one constituent reference in the modeled mixed-package basket, not a disclosed complete mixed-system price or sales share. ([zaber.com](https://www.zaber.com/products/linear-stages/X-LRQ-E))

60. PRO-SV Long-Travel Lift Stages - Aerotech

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Ordering distinguishes rotary-only feedback and component/system integration scopes, supporting configuration attribution rather than an assumed universal controller purchase. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

· Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Five ordering options explicitly combine linear and rotary position feedback as dual-loop; option counts are not used as sales weights. ([aerotech.com](https://www.aerotech.com/wp-content/uploads/2020/xx.xx/PRO-SV-Data-Sheet-D20240219.pdf))

61. 3-Axis NanoMax Flexure Stages - Thorlabs, archived October 31, 2018

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The archived commercial package distinguishes manual differential positioning and internal closed-loop piezo positioning. It supports a historical heterogeneous-package precedent, not observed 2025 revenue. ([punchout.thorlabs.com](https://punchout.thorlabs.com/catalogpages/Obsolete/2018/MAX343_M.pdf))

62. P-737 PIFOC Specimen Z Positioners - PI

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: The P-xx.xx portfolio specifies indirect position sensing, qualifying the assumption that every sensor-equipped piezo stage measures load position directly. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

· Evidence informing base-year allocation inputs; displayed values and growth are calculated: Directly measuring capacitive versions are offered on request, supporting configuration-specific separation from indirect-sensing packages rather than a sales-weight inference. ([pi-usa.us](https://www.pi-usa.us/en/products/piezo-flexure-nanopositioners/z-ztiptilt-piezo-nanopositioning-stages/p-xx.xx-pifoc-specimen-focusing-z-stage-xx.xx))

63. Global Semiconductor Equipment Sales Forecast to Reach a Record $229 Billion in 2028, SEMI Reports
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains semiconductor-related forecast demand; the alignment adoption increment remains an assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports the common semiconductor forecast driver, not a future imaging-stage share.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Reports the USD xx.xx historical WFE proxy and USD xx.xx 2028 projection used in the content and relative-growth model.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: WFE monetary anchors constrain processing exposure; merchant content and captive-sourcing exclusions are assumptions.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Packaging values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Test-equipment values support the approximately USD xx.xx historical proxy and USD xx.xx 2028 forecast.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The July 2026 forecast projects wafer-fab-equipment growth of xx.xx%, xx.xx% and xx.xx% for 2026-2028, constraining the inherited damped growth assumptions for the OEM-exposed cohort.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Differentiated equipment-growth forecasts constrain relative cohort weights used to calculate the integrator share; no future purchasing-role split is directly reported.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The equipment outlook constrains relative cohort growth and therefore the operator share under unchanged within-cohort routing assumptions.
64. KLA Corporation - Form 10-K for the Fiscal Year Ended June 30, 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 wafer-inspection revenue of USD xx.xx and patterning revenue of USD xx.xx anchor a modeled process-control equipment pool; neither is stage revenue.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The modeled peer-expanded process-control pool is excluded from the equipment base receiving the processing-stage content fraction.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports the scope adjustment to the WFE proxy used for separate handling-stage content.
65. ZEISS concludes fiscal year 2024/25 with solid growth
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Industrial Quality & Research revenue declined from EUR xx.xx to EUR xx.xx in FY2024/xx.xx qualifying assumptions of uniformly strong scientific-equipment demand.
66. TRUMPF Annual Report 2024/25
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024/xx.xx Machine Tools revenue fell xx.xx% and Laser Technology revenue fell xx.xx%; this counterevidence supports withholding an additional industrial-processing attachment uplift.

67. Dimensional nano and sub nanometrology - National Physical Laboratory
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Supports separating metrological displacement and stage-measurement uses from imaging compatibility; it does not measure stage sales or documentation premiums.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: NPL documents stage-metrology activity, supporting a dedicated research-and-technical-services use context without disclosing annual stage expenditure.
68. H-811.I2 • H-811.I2HS Miniature Hexapod - Physik Instrumente
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The public precision-assembly offering supports category attribution and the requirement to classify a multipurpose stage once; it is not a sales weight.
69. Facility Equipment - MIRIAM/B22 - Diamond Light Source
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Operational analytical end stations contain identifiable sample-positioning stages; installed equipment establishes use, not annual procurement or facility-attributable stage revenue.
70. Stages & Actuators - Aerotech
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer distinguishes stage offerings used in laser processing from complete automation systems, supporting stage-only processing attribution rather than whole-machine value.
71. Higher Education Research and Development: Fiscal Year 2024, NSF 26-304
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2024 U.S. academic capitalized-equipment expenditure of USD xx.xx provides a budget-scale check. Stage content, global expansion and period adjustments are assumptions; this does not directly verify either share.

72. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Research activities are distinguished from defense administration, supporting separate research-establishment attribution.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military educational institutions are classified by educational activity rather than being automatically assigned to defense.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Military hospitals are assigned to healthcare, preventing public ownership from inflating government-sector allocation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Defense administration excludes separately classified research, education and hospital activities.
73. Domestic Tender Notification of High Precision Linear Stage - IPC/SG/2023/LS-1
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The September 2023 institutional stage RFQ supports educational-operator attribution and procurement obligations, but not a completed purchase or global sales weight.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The September 2023 institution-owned procurement includes supplier installation and post-installation payment, supporting Direct Operator classification regardless of manufacturer or distributor supply. It is a tender, not realized expenditure.
74. Automating Precision Assembly with the SmartStage XY
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The incorporated-stage case spans research through production quality control, challenging automatic Manufacturing attribution from equipment application alone.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The case establishes a possible research destination but supplies no operator-level sales split.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Equipment application does not identify institutional ownership; educational attribution requires a separate operator bridge.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The commercial case identifies a Dover stage incorporated into Cellerate's larger module, supporting OEM attribution without disclosing a purchasing amount.

75. Orders, Shipping & Warranties
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Zaber's military and law-enforcement application restriction is supplier-specific; it qualifies accessible supply without proving market-wide zero demand.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The conditional xx.xx-day standard-product guarantee supports a commercial reversibility distinction, not a measured catalog adoption rate. ([zaber.com](https://www.zaber.com/ordering))
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Published payment-term adjustments are financing charges, not evidence of a configured-stage price premium or annual inflation rate.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nonstandard custom guarantees are case-specific; the model retains this uncertainty without inventing a quantified conversion penalty.
76. AlgaPro TE300 AI Phytoplankton Monitoring
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The current water-monitoring instrument offering identifies an incorporated motorized stage. It supports the commercial attribution premise, not 2025 volume, attributable stage revenue or a standalone utility contract.
77. Novanta Inc. - 2024 Annual Report
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Motion Solutions contributed USD xx.xx in 2024 revenue and is described as mainly serving life-science OEMs. This corroborates commercial OEM participation, not stage-only revenue or global role shares.
78. KAP Consulting - Motion Control Sales & Integration
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: KAP identifies motion-control distribution and integration activities but discloses no complete-stage purchasing amount. This supports separating service influence from the modeled procurement numerator.

79. Locations and Contact - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Territorial and selected-product distributor appointments establish channel boundaries, not whether the underlying purchaser is an equipment OEM.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Distributor appointment alone does not establish integrator procurement; pure resale is looked through without counting its markup.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Selected-product and microscopy-support channels can serve own-use buyers without changing their purchasing-role classification; no channel sales weights are disclosed.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The undated contact page distinguishes manufacturer offices from exclusive and non-exclusive distributors. It constrains direct-access assumptions; historical continuity into 2025 remains unverified.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Exclusive territorial appointments and selected-product coverage establish bounded reseller access, not channel revenue. The model retains indirect activity without deriving weights from distributor counts.

80. ASR-E Motorized Closed-Loop Scanning Stages, XY, Built-in Motor Encoders - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The ASR050B050B-E03T3A is listed at USD xx.xx without a built-in controller. This is the mechanically comparable reference for the package-price bridge, not observed 2025 global realization.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The motor-only ASR-E offering establishes an alternative to onboard-control supply and supplies the denominator of the comparable package-price ratio.

81. X-ASR-E XY Closed-Loop Scanning Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-ASR050B050B-SE03D12 has built-in controllers and a listed direct North American price of USD xx.xx. Compared with the same-size motor-only reference, it calibrates the assumed onboard-package value premium.

82. X-MCC Multi-axis Universal Motor Controller - Zaber
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The X-MCC2 two-axis external controller is listed at USD xx.xx. Its price calibrates an external-control package increment; separately sold controller revenue is not added to the market.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The external-controller price anchors the scale of the explicitly assumed shared supervisory-control allowance. The source does not establish a combined-package price or sales share.
83. Item # A-828.21x00, A-8xx Precision Motion Controllers for 4, 6 or 8 Axes - PI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes a separately housed rack controller and offers a complete positioning system when it is purchased together with a stage. This supports external-control package attribution, not the modeled purchase frequency.
84. Manual Positioning Stages - MISUMI
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: MISUMI identifies its manufactured manual-stage range. Dated March 2022 examples at USD xx.xx and USD xx.xx illustrate price heterogeneity and support value-equivalent rather than raw-unit weighting; they are not used as 2025 global ASPs.
85. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The May xx.xx 2025 equipment record identifies four linear stages with integrated controllers. This independently tests package classification but is not a representative market-sales sample.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The same installation identifies two rotary stages using one external benchtop controller, demonstrating shared external-control hardware without establishing its original invoicing basis.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Coexistence of onboard-controlled linear stages and externally controlled rotary stages does not establish dual-location control electronics within an individual stage package.
86. RCP6 Next-generation ROBO Cylinder - IAI America
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: IAI offers built-in-controller RCP6S slider and table versions and external gateway arrangements serving up to xx.xx axes. This supports a conditional distributed-control commercial architecture, not package-inclusion rates or category revenue.

87. Simplified Motion Series - Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Festo's offering includes guided slide and axis products with integrated electronics. This supports commercial availability underlying the bounded onboard-adoption assumption, without measuring its growth or sales penetration.

88. TIFR/PD/IC23-47/232777 - Notice Inviting Tender, March 19, 2024

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The March xx.xx 2024 tender requests one rotation stage, two linear stages and one vertical stage with built-in or integrated controllers. These four requested stages provide a historical purchasing example, not realized global sales.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The tender separately lists a joystick and accessories; their presence does not automatically convert the onboard-controller stages into combined motion-control packages.

89. Standard and Custom Motion Solutions: 7 Factors to Consider During the Buying Process

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer-authored guide identifies predesigned, documented off-the-shelf stages as a distinct purchasing format, not a measured sales fraction. ([cdn.base.parameter1.com](https://cdn.base.parameter1.com/files/base/indm/multi/document/2022/xx.xx/White_Paper_Standard_and_Custom_Motion_Solutions_7_Factors_to_Consider.61fd5f4357353.pdf))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Predefined configured-to-order supply is distinguished from new engineering, establishing the modeled invoice-scope boundary.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-engineered stage components are distinguished from complete automation systems; only attributable stage assembly value enters this allocation.

90. PlanarDL Two Axis, Mechanical Bearing, Direct-Drive Linear Stage

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Nine predefined PlanarDL models and documented ordering options support configured-stage classification, not catalog-count sales weighting. ([aerotech.com](https://www.aerotech.com/product/planardl-two-axis-mechanical-bearing-direct-drive-linear-stage/))

91. Meeting the Demands of the Most Critical OEMs

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI describes standard offerings as a starting route for OEM purchasing; OEM status alone does not imply a custom stage. ([pi-usa.us](https://www.pi-usa.us/en/customers/meeting-the-demands-of-oems))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The OEM portfolio supports distinguishing existing-product purchasing from requirements needing additional engineering, without disclosing revenue proportions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI publicly offers fully customized OEM positioning products, supporting the specialty-cohort exposure assumption but not its numerical incidence.

92. Zaber Technologies Gimbal - March 19, 2022

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The example combines two named RST rotary stages with surrounding custom parts, supporting stage-level rather than system-label attribution. ([zaber.com](https://www.zaber.com/products/rotary-stages/X-RST-AE/multi-media/zaber-technologies-gimbal))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Alternative published packages do not by themselves demonstrate newly engineered stages; configuration remains distinct from surrounding integration.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Custom-sized brackets and a custom system label do not establish that every incorporated stage belongs to the custom-engineered numerator.

93. MKS Inc. Annual Report 2025
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The 2025 report discloses USD xx.xx Photonics product revenue and direct, distributor and representative selling routes. These constrain a manufacturer-value cohort carried through both anchors; no stage-specific channel percentage is disclosed.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Independent distributors are an expressly identified selling route. The financial pool supports inherited cohort weighting, not the modeled distributor percentage or a future observed split.
94. Parker Hannifin Fiscal 2024 Second Quarter Earnings Release and Presentation - February 1, 2024
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Approximately half of diversified industrial revenue was through distribution, with regional differences. This is an adjacent-market calibration for the assumed industrial direct rate, not a positioning-stage observation.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The presentation reports approximately xx.xx% North American and xx.xx% international distribution penetration and an international expansion objective. Partial realization of that historical objective is an explicit forecast assumption.
95. Parker-Hannifin Corporation Form 10-K - Fiscal Year Ended June 30, 2025
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: FY2025 international industrial revenue of USD xx.xx and total industrial revenue of USD xx.xx provide the regional exposure ratio used to attenuate the modeled distribution-expansion effect.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The industrial international-to-total revenue ratio calibrates the forecast channel-transfer scenario; it is not a stage revenue or future channel-share disclosure.
96. Laurent Melin is PI Group's New Head of Global Sales - December 19, 2023
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The December 2023 announcement describes owned sales/service subsidiaries and an OEM-business focus, supporting direct-sales capability before the base year. Subsidiary counts are not used as sales weights.
    - Evidence informing base-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.
    - Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The announcement also identifies a distributor network, supporting continued indirect participation in the specialist cohort rather than an all-direct classification.

97. Indian Institute of Science - Request for Quote for the Supply of Closed-Loop Cryogenic Nanopositioning System

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The June 2025 RFQ permits eligible Indian manufacturers and imposes quantitative domestic-content thresholds. It establishes purchasing constraints, not direct-sales value or an awarded transaction.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Authorized Indian distributors are eligible subject to the same origin conditions; local services do not qualify imported products. This constrains assumptions that a reseller automatically unlocks restricted demand.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The June xx.xx 2025 RFQ combines cryogenic positioning with an ultrahigh-vacuum option and a nonmagnetic variant. It establishes buyer-side coexistence of requirements, not an award, selected combination, delivery or market share. ([iisc.ac.in](https://www.iisc.ac.in/wp-content/uploads/2025/xx.xx/Tender_-closed_loop_cryogenic_nanopositioning_system.pdf))

98. 1" (25 mm) Travel Dovetail Translation Stages

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The retrieved catalog lists DTS25 at USD xx.xx and DTS25V at USD xx.xx with matched motion and mounting features, supplying the base comparator for the relative-realization model, not a sales weight. ([punchout.thorlabs.com](https://punchout.thorlabs.com/newgrouppage9.cfm?objectgroup_id=xx.xx))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The catalog price ratio xx.xx/xx.xx is used as a modeled single-environment relative realization; global transaction representativeness and stability through 2032 are assumptions.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The single-profile price input affects the common sibling denominator. This source does not establish a combined-environment premium.

99. RSW Family - Rotary Stages, Vacuum Compatible Stages - Zaber

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Direct North American motor-only family prices provide a sensitivity check: RSW USD 1962, low-vacuum RSW-V1 USD xx.xx and high-vacuum RSW-V2 USD xx.xx. Baseline cleanroom suitability prevents treating this as a verified ambient-to-specialized category comparison. ([zaber.com](https://www.zaber.com/products/families/RSW))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Family price comparisons qualify the transferability of the manual-stage premium and support broad realization sensitivity rather than a universal observed premium.
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Higher-scope catalog pricing provides a commercial scale check only; the combined-profile realization of xx.xx remains assumed and is not disclosed by this source.

100. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: PI offers vacuum-ready standard products and request-based modifications. This supports separating environmental qualification from catalog/custom status, but supplies no environmental revenue share. ([pi-usa.us](https://www.pi-usa.us/en/products/vacuum-positioning-stages-actuators))

101. Loan Service for Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The EC*xx.xx loan-kit product line is explicitly described as intended for ambient conditions, independently supporting the standard-environment category mapping. Loan activity is not counted as stage-sales revenue. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/loan-service-nanopositioners))

102. Low Temperature Nanopositioners

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The manufacturer markets low-temperature nanopositioners for demanding combinations including cryogenic, vacuum and magnetic-field environments. This supports commercial category availability, not annual sales quantities or the selected coverage of every configuration. ([attocube.com](https://www.attocube.com/en/products/nanopositioners/low-temperature-nanopositioners))

103. Cleanroom | Festo USA

- Evidence informing base-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: Broad cleanroom-classified automation offerings qualify any assumption that industrial catalog products are necessarily ambient-only; their availability is not a stage-sales weight. ([festo.com](https://www.festo.com/us/en/e/solutions/industries/electronics-industry/cleanroom-id_7016))
- Evidence informing base-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.
- Evidence informing forecast-year allocation inputs; displayed values and growth are calculated: The supplier's documented cleanroom offering supports retaining single-environment activity in industrial demand, while stage-specific configuration and shipment incidence remain unmeasured.

22. Competitive Landscape

22.1. Market Share Analysis, 2025

[redacted] These routes compete for different amounts of OEM-retained responsibility. An entrant can pursue a narrower assembly requirement where the buyer retains integration capability, but should not represent a catalog axis as equivalent to an engineered motion-system commitment.

Software and electronics continuity can shape account access without proving unavoidable lock-in. [redacted] A replacement supplier must establish compatibility with the selected installation and the buyer's acceptance boundary; neither integrated control nor a familiar software name alone settles the switching decision.

Named incorporation and installed-system records provide stronger positioning evidence than an advertised application list, but their scope remains bounded. [redacted] Incumbents can reference the relevant delivery scope; challengers should compete against the customer's actual assembly and support requirement rather than assume that a named application opens the entire account.

Channel mandates constrain account access. [redacted] Where both are available, local coordination competes with the broader catalog access and retained coordination of direct supply.

Regional presence differentiates the engagement route, not necessarily origin or complete-system responsibility. [redacted] A local

address or manufacturer label does not establish procurement eligibility, destination support, or interchangeable application acceptance.

Kensington Laboratories adds an advertised integrated-stage route for semiconductor and photonic equipment. ■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■ ■■■ ■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■ ■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■ ■ ■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ Portfolio evidence establishes participation, not current ownership, destination availability, or an enforceable commitment for a selected order.

Figure 38. Global Motion Positioning Stages Market Share, by Key Player, 2025

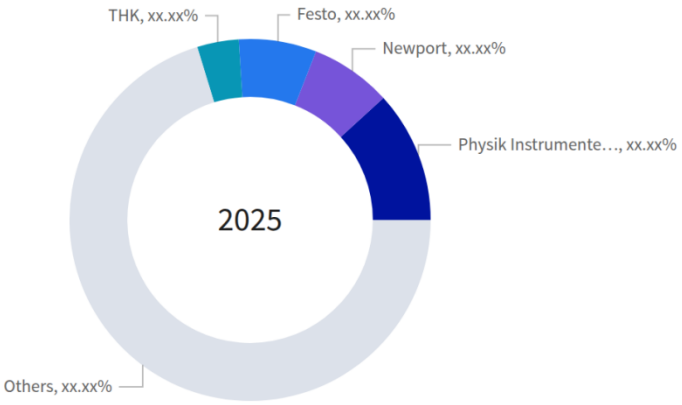


Table 619. Global Motion Positioning Stages Market Share, by Key Player, 2025

Key Player	Share (%)
Aerotech	xx.xx
Allient Inc.	xx.xx
ETEL	xx.xx
Festo	xx.xx
HIWIN	xx.xx
Holmarc	xx.xx
IKO Nippon Thompson	xx.xx
Motion Solutions	xx.xx
Newport	xx.xx
NSK	xx.xx
Parker Hannifin	xx.xx
Physik Instrumente (PI) SE & Co. KG	xx.xx
SIGMAKOKI	xx.xx
SmarAct	xx.xx
THK	xx.xx
Thorlabs	xx.xx
Zaber	xx.xx
Others	xx.xx

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   - Zaber's ASR family separates motor-only and built-in-controller models and advertises microscopy software and mounting support, with features differing by series. ([zaber.com](https://www.zaber.com/products/families/ASR))
   - Evidence informing base-year company-share estimates: Distinguishes motor-only and built-in-controller offerings and supplies current North American asking prices used to test package-value differences, not annual sales.
2. Locations and Contact - Zaber
   - Zaber lists territorial, selected-product, and microscopy-specific appointments and describes direct-support alternatives in some regions. ([zaber.com](https://www.zaber.com/contact/))
   - Evidence informing base-year company-share estimates: Documents territorial and selected-product appointments, supporting the exclusion of duplicate distributor turnover rather than a numerical channel uplift.
3. Automating Precision Assembly with the SmartStage XY
   - Dover Motion reports Cellerate's selection and incorporation of SmartStage XY. The supplier account establishes that named relationship, not continuing orders or independent outcome verification. ([dovermotion.com](https://dovermotion.com/case-studies/automating-precision-assembly-with-the-smartstage-xy/))

4. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program

   · Jefferson Lab's May xx.xx 2025 record identifies Thorlabs integrated-controller linear stages and externally controlled rotary stages within one installation, providing a bounded counterexample to uniform control packaging. ([jlab.org](https://www.jlab.org/sites/default/files/dsg/notes/2025-xx.xx.pdf))

5. Precision Motion Control Technologies | Positioning Systems

   · PI distinguishes individual positioning products from automated photonics-alignment systems incorporating controllers and software. ([pi-usa.us](https://www.pi-usa.us/en/products))

   · Evidence informing base-year company-share estimates: Identifies complete linear, rotary, piezo, air-bearing and hexapod positioning offerings, supporting eligible assembly scope rather than a disclosed revenue mix.

6. Full forward integration - ETEL SA

   · ETEL's Full Forward Integration can include part or all of its listed positioning platforms, frames, isolation, electronics, and software; it is not a uniform delivery commitment. ([etel.ch](https://www.etel.ch/motion-systems/full-forward-integration/))

   · Evidence informing base-year company-share estimates: Full Forward Integration describes a broader, variable commercial package. This supports excluding separately valued surrounding equipment and independent electronics from the modeled stage numerator.

7. Motorized Linear Stage

   · Holmarc identifies its Indian business and manufactured modular stages, distinguishes customer-side multi-axis assembly, and separately addresses custom requirements. ([holmarc.com](https://www.holmarc.com/motorized_ts.php))

   · Evidence informing base-year company-share estimates: The official manufactured-stage offering identifies modular motorized stage families and distinguishes customer assembly of axes from separately negotiated custom requirements. This supports the numerator's assembly and manufacturing boundary, not annual sales volume.

8. 125mm, Center Drive, Thru-Hole, Metric Micrometer Stage

   · Edmund's identified TECHSPEC micrometer-stage record names Japan as origin and Edmund Optics India Private Limited as importer, separating product origin from local representation. ([edmundoptics.in](https://www.edmundoptics.in/p/125mm-center-drive-thru-hole-metric-micrometer-stage/xx.xx/?PrintPDF=true))

9. MGL25 - Mesa de Coordenada com Guias 25mm | KALATEC

   · Kalatec advertises the MGL25 coordinate table, XY configurations, and Brazilian commercial locations; the page does not establish manufacturing origin or every quotation's inclusions. ([kalatec.com.br](https://www.kalatec.com.br/mgl25-mesa-coordenada-guias-25mm/))

10. CXP and CXPF series high-precise motorized linear stages - Zolix Instruments CO.,LTD

    · Zolix attributes the named CXP stage family's design and manufacture to itself and provides a commercial inquiry route. ([zolix.com.cn](https://www.zolix.com.cn/en/prodcon_371_384_418_779.html))

11. Instrument design - European XFEL

    · European XFEL attributes its FXE sample-mounting stage to JJ X-Ray, establishing facility-specific participation rather than general current supply availability. ([xfel.eu](https://www.xfel.eu/facility/instruments/fxe/instrument_design/index_eng.html))

12. Custom Positioning Stages | Electromate Canada

    · Electromate advertises engineering-supported custom positioning stages and specifically promotes Lintech, establishing a purchasing route rather than independent manufacturing attribution. ([electromate.ca](https://www.electromate.ca/robotic-automation/robotic-systems-and-stages/custom-positioning-stages/))

13. Integrated Automation Systems | Aerotech

    · Aerotech advertises scalable integration, project management, system design, and motion-application support, supporting comparison of purchased responsibility rather than stage mechanics alone. ([aerotech.com](https://www.aerotech.com/integrated-automation-systems-overview/))

14. Bell-Everman - LowBoy Stages in Semilab Systems

· Bell-Everman's manufacturer-authored case identifies LowBoy stages incorporated into named Semilab equipment; it does not establish subsequent purchasing commitments. ([bell-everman.com](https://www.bell-everman.com/BE_CS_Semilab.pdf))

15. Integrated Precision Stages for Automation | X-Y-Z-□ Stages

· Kensington Laboratories advertises integrated translation and rotary positioning stages for wafer and photonic-device applications and invites configuration-specific quotations. ([kensingtonlabs.com](https://kensingtonlabs.com/products/integrated-stages/))

16. Custom Wafer & Precision Motion Control Stages

· Kensington describes custom stage supply ranging from modifications of existing products to new designs and integration of third-party components. These are advertised supply routes, not verified order-specific commitments. ([kensingtonlabs.com](https://kensingtonlabs.com/products/precision-motion-control/))

17. MKS Inc. - Form 10-K for the Year Ended December 31, 2025, filed February 24, 2026

· Evidence informing base-year company-share estimates: The filed 2025 financial statements report Photonics Solutions Division product revenue of USD xx.xx, services of USD xx.xx and total revenue of USD xx.xx.

· Evidence informing base-year company-share estimates: The 2024 product comparison is USD xx.xx. These are broader financial pools, not Newport stage-only revenue; the xx.xx% stage fraction remains assumed.

18. MKS Instruments Showcases Customer-Focused Photonics Innovations at SPIE's Photonics West 2025

· Evidence informing base-year company-share estimates: The January xx.xx 2025 announcement identifies Newport within MKS's Photonics Solutions Division and advertises Newport HybrYX XY positioning stages.

· Evidence informing base-year company-share estimates: This establishes dated brand and stage participation, not annual stage revenue or the assumed financial-pool attribution.

19. HIWIN Technologies Corporation and Subsidiaries - Consolidated Financial Statements for 2025 and 2024

· Evidence informing base-year company-share estimates: Audited calendar-2025 consolidated sales are TWD xx.xx, including TWD xx.xx in the category excluding separately reported guideways and ballscrews.

· Evidence informing base-year company-share estimates: The filing identifies HIWIN Mikrosystem as another related party and reports an xx.xx% investment, supporting exclusion of its full turnover from the consolidated numerator.

· Evidence informing base-year company-share estimates: The financial pool supports the model input, not the assumed xx.xx% net qualifying-stage fraction.

· Evidence informing base-year company-share estimates: HIWIN's audited non-guideway/non-ballscrew revenue pool provides a component-led commercial comparison for testing THK's assumed stage intensity, not direct THK sales evidence.

20. HIWIN Technologies Corp. - Annual Report 2025

· Evidence informing base-year company-share estimates: The annual report identifies robots and torque-motor rotary tables alongside component businesses and reports approximately xx.xx% robot and xx.xx% other-product revenue.

· Evidence informing base-year company-share estimates: These mixed categories constrain the scope model but do not disclose finished-stage revenue.

21. Single Axis Stages | HIWIN

· Evidence informing base-year company-share estimates: The official portfolio advertises single-axis stages and configurable multi-axis systems, including assembly and kit purchasing routes.

· Evidence informing base-year company-share estimates: Compatibility with HIWIN and third-party motors supports narrower assembly attribution without a mandatory affiliated-electronics assumption; it supplies no revenue weights.

22. Federal Reserve Board - Foreign Exchange Rates, G.5A Annual, January 5, 2026
    - Evidence informing base-year company-share estimates: The observed 2025 annual-average exchange rate of TWD xx.xx per USD converts the scoped HIWIN product pool.
    - Evidence informing base-year company-share estimates: Annual-average currency conversions support the monetary comparison underlying the workforce calibration.
    - Evidence informing base-year company-share estimates: JPY xx.xx per USD is used to convert the modeled 2025 stage numerator.
    - Evidence informing base-year company-share estimates: JPY xx.xx per USD converts the scoped industrial-machinery numerator.
    - Evidence informing base-year company-share estimates: JPY xx.xx per USD converts the modeled calendar-year stage numerator.
    - Evidence informing base-year company-share estimates: JPY xx.xx per USD converts the modeled precision-products stage numerator.
    - Evidence informing base-year company-share estimates: USD xx.xx per EUR converts PI's financial calibration used in ETEL's modeled numerator.
    - Evidence informing base-year company-share estimates: The 2025 annual-average exchange rate of INR xx.xx per USD converts Holmarc's modeled calendar-year stage revenue to the frozen nominal-USD measurement basis.
23. Recruiting FAQs
    - Evidence informing base-year company-share estimates: Reports more than xx.xx worldwide employees and distinguishes positioning products, engineered systems and integrated automation. Supports the workforce anchor and exclusions, not the assumed revenue intensity or stage fraction.
24. Positioning 2026 Business Report - HOERBIGER
    - Evidence informing base-year company-share estimates: Reports PI's 2025 sales of EUR xx.xx, approximately 1900 employees, weaker demand conditions and the March xx.xx 2026 ownership closing. Stage attribution remains assumed.
    - Evidence informing base-year company-share estimates: PI sales and staffing provide a precision-motion whole-business revenue-per-employee comparable for Aerotech's modeled commercial realization.
    - Evidence informing base-year company-share estimates: PI sales and staffing constrain the shared commercial realization range; they do not observe Thorlabs stage productivity.
    - Evidence informing base-year company-share estimates: PI sales and staffing constrain the shared commercial realization range; they do not observe Zaber revenue.
    - Evidence informing base-year company-share estimates: PI's EUR xx.xx 2025 sales and approximately 1900 personnel provide a comparable commercial productivity anchor; they do not measure SmarAct sales.
    - Evidence informing base-year company-share estimates: PI's disclosed business scale supplies ETEL's revenue-per-employee calibration before explicit realization and stage-scope assumptions.
25. Federal Reserve G.5A Annual Foreign Exchange Rates - January 5, 2026
    - Evidence informing base-year company-share estimates: The 2025 USD xx.xx/EUR annual average converts PI's euro sales.
    - Evidence informing base-year company-share estimates: The 2025 EUR and JPY annual averages support comparable-company workforce calibration in USD.

26. SIGMAKOKI Integrated Report 2025
    - Evidence informing base-year company-share estimates: JPY xx.xx fiscal-2025 sales and xx.xx employees provide the lower whole-business commercial productivity comparable.
    - Evidence informing base-year company-share estimates: Fiscal sales and staffing constrain the selected USD xx.xx realization assumption; they do not disclose Thorlabs stage revenue.
    - Evidence informing base-year company-share estimates: Fiscal sales and staffing constrain the selected USD xx.xx realization assumption; they do not disclose Zaber revenue.
    - Evidence informing base-year company-share estimates: Consolidated revenue and xx.xx personnel provide the lower commercial revenue-per-employee calibration used for SmarAct.
    - Evidence informing base-year company-share estimates: The year ended May 2025 reports JPY xx.xx optical-basic-equipment and JPY xx.xx automatic-applied-product revenue. These are the observed pools to which explicit stage fractions and a calendar bridge are applied.
    - Evidence informing base-year company-share estimates: Prior-year product figures provide a quantitative challenge to assuming uniform motorized-stage growth.
27. Jennifer Cable - Global Photonics Economic Forum 2025
    - Evidence informing base-year company-share estimates: The company-president profile for the October 2025 forum reports more than xx.xx worldwide employees, constraining the assumed stage-workload scale.
28. Thorlabs - EPIC Annual Meeting 2022: Global and European Growth Strategy
    - Evidence informing base-year company-share estimates: The company-authored 2022 presentation identifies Ely motion-control and optical-table activities and approximately xx.xx European employees. Supports manufacturing scope, not 2025 stage staffing.
29. Parker-Hannifin Corporation - Form 10-K for the Year Ended June 30, 2025
    - Evidence informing base-year company-share estimates: Reports FY2025 Motion Systems platform revenue of USD xx.xx, providing the narrower financial pool. The xx.xx% stage attribution and calendar bridge are modeled.
30. Parker Electronic Controls & Motion Division Industrial Products Systems
    - Evidence informing base-year company-share estimates: Identifies precision-stage families separately from motors, controllers, gearboxes and actuators, supporting the narrow complete-stage attribution boundary.
31. Zaber Technologies - Company Profile
    - Evidence informing base-year company-share estimates: Zaber's company-authored profile supplies a current xx.xx-xx.xx employee band. The xx.xx-person base-year point is assumed, not reported.
32. About Zaber Technologies Inc.
    - Evidence informing base-year company-share estimates: Identifies Zaber Technologies Inc. as a designer and manufacturer of precision-positioning devices, supporting manufacturer rather than reseller attribution.
33. Allied Motion Technologies Inc. - Form 10-K for the Year Ended December 31, 2021
    - Evidence informing base-year company-share estimates: Reports USD xx.xx of combined ORMEC/ALIO revenue after their November 2021 acquisitions. Supports the historical realized-revenue anchor, not the annualization, stage fraction or 2025 growth bridge.
34. Stages - Allient, Inc.
    - Evidence informing base-year company-share estimates: Attributes complete positioning-stage offerings to ALIO within Allient, supporting current commercial continuity and parent-level stage attribution without a separate ALIO numerator.
35. Novanta Inc. Annual Report 2025
    - Evidence informing base-year company-share estimates: Reports USD xx.xx Motion Solutions revenue in 2024 and Precision Medicine capability revenue of USD xx.xx in 2025 versus USD xx.xx in 2024. Supports the historical anchor and adjacent cycle proxy, not a directly observed 2025 company numerator.
36. LGS Stages - High Performance Linear Positioning Stages
    - Evidence informing base-year company-share estimates: The 2025 brochure identifies LGS positioning stages through Motion Solutions, supporting an own-stage commercial offering distinct from broad component resale and subsystem revenue.

37. nPoint, Inc. Joins the Motion Solutions Family
· Evidence informing base-year company-share estimates: Documents nPoint joining Motion Solutions in 2020, supporting inclusion of its eligible stage activity within the same company numerator rather than a duplicate addition.
38. SmarAct Group | Innovations in Precision Technology
· Evidence informing base-year company-share estimates: SmarAct describes over xx.xx personnel and three business units. This anchors a workforce proxy, not observed 2025 stage revenue.
39. Motion Products & Nano-Positioning Systems - SmarAct
· Evidence informing base-year company-share estimates: The portfolio establishes finished positioning-stage offerings and supports separating these assemblies from metrology and complete automation activity.
40. THK Business Strategy: Industrial Machinery Business - Reflecting on 2025
· Evidence informing base-year company-share estimates: THK reports calendar-2025 industrial-machinery revenue of JPY xx.xx. Only an explicitly modeled net complete-stage portion enters the numerator.
41. Unit Solutions - THK
· Evidence informing base-year company-share estimates: AX, CMX, DX and EX establish identifiable proprietary stage assemblies, supporting the commercial boundary of the modeled numerator rather than allocation of component revenue wholesale.
42. THK CHUO - THK
· Evidence informing base-year company-share estimates: The THK CHUO presentation establishes shared commercial branding but does not resolve underlying manufacturing attribution. No separate CHUO manual-stage turnover is added to the THK estimate.
43. Nippon Thompson Financial Results Supplement for the Year Ended March 31, 2026
· Evidence informing base-year company-share estimates: Linear-motion-series revenue was JPY xx.xx for the year ended March 2025 and JPY xx.xx for the year ended March 2026. These observed pools constrain the explicit calendar and stage-content model.
44. Nippon Thompson Integrated Report 2025
· Evidence informing base-year company-share estimates: The company report identifies IKO's manufacturer perimeter and complete mechatronic positioning tables alongside individual linear-motion components. It supports the scope distinction, not the assumed xx.xx% stage fraction.
45. NSK Fact Book for FY2025 Second-Quarter Results
· Evidence informing base-year company-share estimates: NSK reports precision-machinery-and-parts revenue of JPY xx.xx for the year ended March 2025 and JPY xx.xx for April-September 2025, versus JPY xx.xx in the prior-year half. These constrain the modeled annualization.
46. XY Tables - NSK Global
· Evidence informing base-year company-share estimates: The official XY-table and module portfolio establishes the finished-assembly scope used to distinguish attributable stages from separate precision components.
47. Company - ETEL SA
· Evidence informing base-year company-share estimates: ETEL identifies approximately xx.xx employees, xx.xx% engineers and HEIDENHAIN group membership. These support workforce scale and economic perimeter, not observed 2025 stage revenue.
48. Holmarc Opto-Mechatronics Limited - Annual Report 2025-2026
· Evidence informing base-year company-share estimates: The product-wise performance table reports separate linear/rotation and motorized linear/rotation stage revenue for fiscal years ended March 2025 and March 2026. These are the observed monetary inputs to the modeled calendar-year numerator; the source does not publish the final market share.
49. Festo provides Basis for Growth
· Evidence informing base-year company-share estimates: Festo reports approximately xx.xx factory/process-automation customers and EUR xx.xx of 2025 turnover. The customer population anchors the modeled purchasing-cohort calculation; stage-buyer incidence, packages per buyer and realization remain assumptions.

50. Electric slides EGSK - Festo
    - Evidence informing base-year company-share estimates: The December 2024 commercial catalog documents complete electric-slide assemblies and multi-axis options. It supports attributable stage participation and exclusion of standalone components, but does not establish the modeled purchasing frequency or realized price.

22.2. Market Concentration Analysis, 2025

Competitive control is concentrated at particular interfaces rather than established by the number of supplier names. PI's affiliated ACS Motion Control capability and ETEL's HEIDENHAIN group relationship provide routes to combined mechanics, sensing, controls, and support. ■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■ ■■■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■ ■■■■■ ■■■■ ■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■ ■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■

Brand and legal-form overlap must not be mistaken for independent sourcing. ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■ ■■■■■■■■ ■■■■■■ ■■■ ■■■■■■ ■■■■ ■■■■■ ■■■ ■■■■ ■■ ■ ■■■ ■■ ■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■ ■■■ ■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■ ■■■■■■ ■■■■■ ■■■■■ ■■■■■ ■■■■■■ ■■■ ■■■■■■ ■■■■■ ■■■■■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■■■ Buyers seeking supply diversification should identify the responsible business relationship behind each quotation.

Shared commercial presentation is not sufficient to allocate manufacturing or control. ■■■ ■■■ ■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■ ■■■ ■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■■ ■■ ■■■■■■■ ■■■■■ ■■■■ ■■■■ These unresolved allocations matter when a buyer wants independent supply, origin assurance, or escalation rights; a second brand or sales route is not proof of an independent source.

Common ownership can connect complementary capabilities without making their products equivalent. Steinmeyer Mechatronik GmbH and Feinmess Suhl GmbH are identified within the Steinmeyer group, but Feinmess Suhl's engineering description does not establish a separately attributable current catalog-stage range. ■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■ ■■■■■■ ■■■■■■■■

Channels can multiply purchasing routes without multiplying underlying stage supply. Edmund Optics' selected-product Zaber appointment and Electromate Inc.'s promotion of

Lintech custom stages illustrate this distinction. ■ ■■■■■ ■■■ ■■■■■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■■■ ■■■■ ■■■■■■■■■■■ ■■■ ■■■ ■■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■ ■■■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■■

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Sources & Evidence

1. About PI US: Custom Design & Service / Export Controlled Applications & ITAR Registered
   · PI describes its ACS Motion Control ownership relationship, supporting affiliated control capability without establishing controller inclusion in every offering. ([pi-usa.us](https://www.pi-usa.us/en/about-pi))
2. Locations and Contact - Zaber
   · Edmund's selected-product appointment establishes another purchasing route without establishing independent underlying stage manufacture. ([zaber.com](https://www.zaber.com/contact/))
3. Motorized Stage | SURUGA SEIKI CO., LTD.
   · Suruga separately lists motorized and motorless stage families, establishing an alternative to an assumed fully affiliated actuation package. ([eng.surugaseiki.com](https://eng.surugaseiki.com/products-list/motorized-stage/))
4. MISUMI Expands Automated Positioning Stage Production for Data Centers
   · MISUMI's January xx.xx 2026 group announcement does not allocate every advertised stage or manufacturing activity to Suruga. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
5. Company - ETEL SA
   · ETEL identifies membership in the HEIDENHAIN Corporate Group and a group sales/support network, establishing affiliation rather than package-level obligations. ([etel.ch](https://www.etel.ch/company/))
6. Linear Micro Stages - New Scale Technologies
   · M3-LS embeds control and drive electronics, coupling the stage-and-control selection within the advertised module. ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))
7. New Scale Technologies, Inc. - Terms and Conditions, Revision 05.06.2025
   · New Scale's sales terms default to written part-number specifications unless different requirements are accepted in writing and exclude fitness-for-purpose warranties. ([newscaletech.com](https://newscaletech.com/wp-content/uploads/NewScale-Terms-Conditions_2025.pdf))
8. Buy LES/LE2S/LESH/LE2SH/LESYH online | SMC South Africa
   · The SMC-branded regional catalog presents the electric-table portfolio associated with SMC Corporation, without establishing another independent manufacturer for the shorter SMC identity. ([smc.eu](https://www.smc.eu/en-za/products/les-le2s-lesh-le2sh-lesyh~xx.xx~nav))
9. igus changes its legal form to SE & Co. KG and sets the course for further growth
   · The November xx.xx 2025 announcement states continuity from igus GmbH to igus SE & Co. KG, supporting overlapping brand/former-name attribution. ([press.igus.eu](https://press.igus.eu/igus-changes-its-legal-form-to-se-co-kg-and-sets-the-course-for-further-growth/))

10. Custom Positioning Stages | Electromate Canada
    · The named Lintech offering shows that another seller does not itself establish an independent stage-manufacturing alternative.
    ([electromate.ca](https://www.electromate.ca/robotic-automation/robotic-systems-and-stages/custom-positioning-stages/))
11. Single Axis Stages | HIWIN
    · HIWIN advertises compatibility with its own and third-party servo and stepper motors, countering an assumption of mandatory affiliated motor supply. ([hiwin.com](https://hiwin.com/products/single-axis-stages/))
12. Queensgate Instruments has been acquired by Prior Scientific Instruments Ltd
    · Prior's May xx.xx 2018 announcement establishes its acquisition of Queensgate Instruments and identifies Queensgate as a Prior Scientific brand.
    ([prior.com](https://www.prior.com/us/news/queensgate-instruments-has-been-acquired-by-prior-scientific-instruments-ltd/))
13. About Us - Nippon Pulse America, Inc.
    · Nippon Pulse America identifies itself as wholly owned by Nippon Pulse Motor Co., Ltd., supporting parent/regional-brand attribution rather than independent sourcing.
    ([nipponpulse.com](https://www.nipponpulse.com/about-us/))
14. THK CHUO | THK
    · THK presents manual and Fix Stage products under THK CHUO branding; the page does not state the underlying equity, licensing, or manufacturing allocation.
    ([thk.com](https://www.thk.com/precisionstage/eu/en/index.html))
15. Steinmeyer Gruppe
    · Steinmeyer Group identifies Steinmeyer Mechatronik GmbH and Feinmess Suhl GmbH within its group structure, supporting common-group attribution without product equivalence.
    ([steinmeyer-group.com](https://www.steinmeyer-group.com/de/ueber-steinmeyer/steinmeyer-gruppe/))
16. Engineering - Feinmess Suhl GmbH
    · Feinmess Suhl describes engineering and assembly activities for positioning systems and tables without establishing a named current catalog-stage range.
    ([feinmess-suhl.com](https://www.feinmess-suhl.com/engineering/))
17. Novanta completes acquisition of Motion Solutions
    · Novanta's filed announcement establishes completion of the Motion Solutions acquisition on January xx.xx 2024. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/novt-ex99_1.htm))
18. MKS Inc. Unveils Photonics Solutions to Advance AI, Quantum, and Biotech at Photonics West 2026
    · MKS presents Newport within its photonics offering and includes precision motion among its commercial capabilities.
    ([investor.mks.com](https://investor.mks.com/news-releases/news-release-details/mks-inc-unveils-photonics-solutions-advance-ai-quantum-and))
19. About Us | Thomson Industries
    · Thomson identifies its relationship with Regal Rexnord's Linear Motion Division; affiliation alone does not establish stage-specific contractual obligations.
    ([thomsonlinear.com](https://www.thomsonlinear.com/en/about))

22.3. Recent Developments & Impact Analysis, 2025

[redacted] HOERBIGER's description also connects PI with PI Ceramic and ACS Motion Control, reinforcing the relevance of its integrated-system proposition. Buyers should identify the actual seller and accepted package after the ownership change; the transaction does not itself establish changed order terms, service obligations, or mandatory use of affiliated controls.

[illegible] Because Suruga Seiki Co., Ltd. is a MISUMI subsidiary, buyers should also avoid assigning all announced group activity to Suruga-branded offerings. The decision trigger is a configuration-specific quotation identifying the manufacturing and selling entities and the delivery commitment.

Novanta completed its acquisition of Motion Solutions on January xx.xx 2024. The subsequent Novanta-branded LGS brochure retains a Motion Solutions commercial route for positioning stages and custom solutions. [illegible]

The November xx.xx 2025 igus legal-form announcement establishes continuity from igus GmbH to igus SE & Co. [illegible] The legal-form change is not evidence of a new positioning-table capability.

mechOnics ag's October xx.xx 2024 announcement introduced DSP50 for single- and multi-axis positioning and described standard and vacuum versions. This adds a named configuration-and-controller proposition to the specialist comparison rather than proving superiority over other compact-stage suppliers. [illegible]

Sources & Evidence

1. MISUMI Expands Automated Positioning Stage Production for Data Centers
   · MISUMI announced planned automated-positioning-stage production expansion at sites in China and Vietnam; the announcement is not confirmation of completion or a particular delivery commitment. ([misumi.co.jp](https://www.misumi.co.jp/english/news/press_260129_2))
2. igus changes its legal form to SE & Co. KG and sets the course for further growth
   · The change is a legal-form event with operating continuity, not evidence of another supplier or new stage capability. ([press.igus.eu](https://press.igus.eu/igus-changes-its-legal-form-to-se-co-kg-and-sets-the-course-for-further-growth/))

3. Novanta completes acquisition of Motion Solutions
   · The completed transaction changes corporate attribution for the customized precision-motion subsystem business without defining individual project obligations. ([sec.gov](https://www.sec.gov/Archives/edgar/data/xx.xx/xx.xx/novt-ex99_1.htm))
4. Positioning 2026 Business Report - HOERBIGER
   · HOERBIGER states that the PI acquisition closed on March xx.xx 2026 and established its Positioning Division; it identifies PI Ceramic and ACS Motion Control within the integrated business proposition. ([hoerbiger.com](https://www.hoerbiger.com/en/newsroom/yearbook/positioning-2026-business-report.html))
5. LGS Stages - High Performance Linear Positioning Stages
   · The Novanta-branded LGS brochure retains a Motion Solutions commercial route for positioning stages and custom-solution activities. ([motionsolutions.com](https://www.motionsolutions.com/wp-content/uploads/2025/xx.xx/Novanta-LGS-Brochure-May-v7.pdf))
6. New development finished: DSP50 multi-phase linear stage
   · mechOnics' October xx.xx 2024 announcement identifies DSP50 for single- and multi-axis positioning, with standard and vacuum alternatives and an associated controller proposition. ([mechonics.de](https://www.mechonics.de/home/news/article/new-development-finished-dsp50-multi-phase-linear-stage-kopie-xx.xx/))

22.4. Product Portfolio Analysis, 2025

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General-purpose catalog alternatives differ in their surrounding commercial context. ▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ Neither catalog breadth nor adjacent products establish that the supplier accepts responsibility for the buyer's complete instrument.

Motor and controller inclusion create a separate industrial procurement boundary. ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ Buyers retaining established motors can investigate the narrower supply routes, but must establish the accepted motor interface and electronics scope before treating them as substitutes for a controlled axis.

RESEARCH SAMPLE REPORT

Manual positioning is a substantive portfolio choice rather than an incomplete version of automation. Del-Tron Precision, Inc. distinguishes micrometer-only products from families offering manual and motorized actuation. [redacted]

Compact piezo portfolios serve different assembly requirements. [redacted] These portfolios support a specialist shortlist, but a common piezo label does not settle the required travel arrangement, feedback package, environment, or commercial availability of a named configuration.

Electronics packaging distinguishes compact-stage suppliers more clearly than the motor label alone. [redacted] An instrument OEM can therefore compare an embedded module, a bundled development package, and a separately controlled positioner, but should not assume that development-kit supply establishes production support or finished-instrument acceptance.

[redacted] A research buyer should shortlist the documented environmental configuration and agree the supplied controls and support terms. A broad environmental portfolio is not evidence that every model covers the same combination of conditions.

Guidance and supporting equipment can change the purchase beyond the stage carriage. ABTech's hydrostatic proposition includes supporting pump and filtration equipment, alongside mechanical and air-bearing alternatives. [redacted]

Microscopy suppliers compete around different moving assemblies and instrument interfaces. [redacted] A supplier with a suitable axis is not automatically a substitute for a microscope-specific package.

Engineered-system suppliers offer alternatives to independently assembling catalog axes. SCHNEEBERGER advertises engineered positioning systems; PM B.V. and LAB Motion Systems present stage and custom-system portfolios; JAT - Jenaer Antriebstechnik GmbH offers customer-specific XY systems. [redacted]

Industrial direct-drive and multi-axis portfolios create another peer group. [redacted] These suppliers should be compared against a defined machine requirement, not placed in a universal performance hierarchy.

Modular automation packages extend the alternatives beyond laboratory-centered stages. isel's LES catalog describes guided axes and cross-table arrangements; Bosch Rexroth advertises multi-axis systems through its African business; FUYU Technology Co., Ltd. lists Cartesian positioning assemblies. [redacted]

[redacted]

[illegible] These offerings can address industrial positioning requirements, but switching between them depends on the accepted actuation architecture and the quoted controls, utilities, and installation boundary. A broader automation catalog does not establish equivalent stage-level obligations.

Machining and equipment-accessory portfolios should be compared by the separately supplied table, not the host machine. [illegible] These are relevant purchasing alternatives where the documented table matches the requirement, but manufacturer attribution, model lifecycle, control inclusion, and host-equipment acceptance remain distinct questions.

Regional engagement can be purchased through different supplier roles. [illegible] An institutional buyer should obtain item-specific origin and seller documentation; an OEM should additionally define assembly, installation, and repair responsibilities.

China-based alternatives also require offering-level rather than country-level comparison. [illegible] These records support commercial inquiries, but do not establish equivalent export support, accepted application responsibility, or a common contracting-entity standard.

[illegible] Elcam advertises precision XYZ tables, but the proprietary-manufacturing versus distribution allocation remains unsettled. Buyers should distinguish a defined alignment product, an own-manufactured

table, and an intermediary's quoted assembly before assigning responsibility for customization or support.

Gilman Precision's slides catalog and Labjacks.com Inc.'s height-positioning offerings add complete manual-assembly alternatives with different buyer settings. ■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■ ■■ ■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■■■ ■■■■■■■■ ■■■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■ ■■ ■■■■■■■■■■■■■■■■ For an operator retaining manual adjustment, a documented complete assembly can be preferable to adding motor and controller procurement; automation is appropriate only when its additional responsibilities are explicitly covered.

Sources & Evidence

1. Precision Motion Control Technologies | Positioning Systems
   · PI lists mechanical, piezo, air-bearing, and hexapod positioning offerings and photonics-alignment packages with controllers and software. ([pi-usa.us](https://www.pi-usa.us/en/products))
2. Motorized Stage | SURUGA SEIKI CO., LTD.
   · Motorless and motorized linear, rotary, and goniometer offerings allocate motor-selection responsibility differently. ([eng.surugaseiki.com](https://eng.surugaseiki.com/products-list/motorized-stage/))
3. Nanopositioners - nanopositioning made simple
   · attocube separates low-temperature nanopositioners from ambient-and-vacuum offerings and presents integrated positioning alternatives. ([attocube.com](https://www.attocube.com/en/products/nanopositioners))
4. Motorized XY Microscope Stages | High-Precision Positioning
   · Prior lists microscope-specific motorized stage configurations and customization/OEM routes. ([prior.com](https://www.prior.com/us/imaging-components/motorized-stages/))
5. Development Kits for Piezo Stages & Actuators | Xeryon
   · Xeryon's development kits combine a stage with separately identifiable control and connection equipment. ([xeryon.com](https://xeryon.com/products/development-kits/))
6. Motorized Linear Stage
   · The catalog distinguishes modular axes and customer assembly from separately negotiated custom requirements. ([holmarc.com](https://www.holmarc.com/motorized_ts.php))
7. Precision Linear Stages | ABTech Linear Bearings
   · ABTech's portfolio includes hydrostatic, air-bearing, and mechanical stages and describes pump and filtration equipment within its hydrostatic system proposition. ([abtechmfg.com](https://www.abtechmfg.com/precision-motion-components/linear-stages))
8. Linear Micro Stages - New Scale Technologies
   · New Scale advertises embedded-control modules and developer packages, supporting comparison with separately controlled compact stages. ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))
9. Precision Stages by Deltron Precision
   · Del-Tron distinguishes micrometer-only products from configurable stage families with manual and motorized actuation. ([deltron.com](https://deltron.com/precision-stages.html))
10. MGL25 - Mesa de Coordenada com Guias 25mm | KALATEC
    · MGL25 establishes a named Brazil-based commercial inquiry route for an identifiable positioning assembly. ([kalatec.com.br](https://www.kalatec.com.br/mgl25-mesa-coordenada-guias-25mm/))
11. SMC - Air Slide Table MXQ Series
    · SMC advertises MXQ pneumatic slide-table offerings, providing an actuation alternative to electric tables. ([smcworld.com](https://www.smcworld.com/products/subject/en-ph/newgen_space/air_cylinder/mxq.html))

12. Buy LES/LE2S/LESH/LE2SH/LESYH online | SMC South Africa
    · The catalog distinguishes electric table alternatives, including motor-equipped and motorless arrangements. ([smc.eu](https://www.smc.eu/en-za/products/les-le2s-lesh-le2sh-lesyh~xx.xx~nav))
13. CXP and CXPF series high-precise motorized linear stages - Zolix Instruments CO.,LTD
    · The named motorized offering does not itself establish a complete supplied control system. ([zolix.com.cn](https://www.zolix.com.cn/en/prodcon_371_384_418_779.html))
14. Single Axis Stages | HIWIN
    · HIWIN's named single-axis assemblies provide a motor-selection comparison within an identifiable guided assembly. ([hiwin.com](https://hiwin.com/products/single-axis-stages/))
15. MKS Inc. Unveils Photonics Solutions to Advance AI, Quantum, and Biotech at Photonics West 2026
    · Newport's precision-motion role sits within a broader photonics purchasing context rather than establishing a stage-only supply commitment. ([investor.mks.com](https://investor.mks.com/news-releases/news-release-details/mks-inc-unveils-photonics-solutions-advance-ai-quantum-and))
16. Stages - Allient, Inc.
    · Allient advertises ALIO-branded monolithic translation stages and hybrid-hexapod offerings, supporting an alternative combined-motion portfolio without superiority claims. ([allient.com](https://allient.com/product-category/stages/))
17. Symetrie - Company Profile
    · Symetrie's company profile separates positioning and dynamic-motion hexapods and distinguishes standard from custom products. ([symetrie.fr](https://symetrie.fr/wp-content/uploads/2025/xx.xx/Company_Profile_2025_EN.pdf))
18. Parker Electronic Controls & Motion Division Industrial Products Systems
    · Parker's industrial portfolio includes precision positioning tables, linear-motor stages, and focusing nanopositioners. ([corpapps.parker.com](https://corpapps.parker.com/interactive-media/division/electronic-controls-motion/industrial-products/))
19. Linear Stages : Linear Slide Positioners : Newmark Systems Inc
    · Newmark Systems lists named linear-stage families and multi-axis possibilities, establishing an axis-level catalog alternative. ([newmarksystems.com](https://www.newmarksystems.com/linear-positioners/))
20. UniSlide Linear Positioning Stages
    · Velmex advertises motorized UniSlide positioning assemblies and modular multi-axis arrangements. ([velmex.com](https://velmex.com/products/unislide/motorized_unislides))
21. Linear Stages | Griffin Motion, LLC
    · Griffin Motion's catalog lists identifiable linear-stage families, supporting a catalog-axis comparison rather than inferred complete-equipment responsibility. ([griffinmotion.com](https://www.griffinmotion.com/shop/product-category/linear-stages))
22. Rotary Positioning Actuators, Stages and Tables | Lintech
    · Lintech advertises rotary positioning tables for use with servo or stepper systems, leaving package scope to the selected offering. ([lintechmotion.com](https://www.lintechmotion.com/Rotary-Actuator-Stage-Table.cfm))
23. Precision Positioning Table TU | IKO NIPPON THOMPSON
    · IKO advertises TU precision-positioning tables as configurable commercial assemblies. ([me-iko.com](https://www.me-iko.com/mecha-tool/product/en/mecha_TU_en.php))
24. XY Tables | NSK Global
    · NSK advertises XY positioning tables and modules for equipment applications, establishing assembly-level alternatives. ([nsk.com](https://www.nsk.com/products/precision-machine-components/xy-tables/))
25. Unit Solutions | THK
    · THK's unit-solution portfolio advertises identifiable precision and alignment-stage assemblies, distinct from upstream components alone. ([thk.com](https://www.thk.com/us/en/contents/pages/special/actuator/unit/))

26. NB POSITIONING TABLE | NIPPON BEARING CO., LTD.
    · Nippon Bearing maintains a dedicated positioning-table offering. ([nipponbearing.com](https://www.nipponbearing.com/english/products/positioningtable/))
27. KSS - Actuator Outline
    · KSS describes its single-axis actuator as a compact stage-type assembly combining a screw and linear guide, resolving the component-versus-guided-assembly distinction for the documented category. ([kssballscrew.com](https://www.kssballscrew.com/us/pdf/catalog/12_v13.3_Actuator_Outline.pdf))
28. Positioners by OWIS
    · OWIS advertises manual and motorized linear, rotary, XY, elevator, swivel, and tilt positioners. ([owis.eu](https://www.owis.eu/en/landingpages/positioners))
29. Positioning stages - Kohzu Precision Co., Ltd.
    · Kohzu lists manual and motorized positioning-stage categories, supporting actuation-specific catalog comparison. ([kohzuprecision.com](https://www.kohzuprecision.com/products/positioning-stages/))
30. Opto-Mechanical Products - Standa
    · Standa's portfolio lists identifiable optical-positioning and motorized-stage offerings. ([standa.lt](https://www.standa.lt/products/))
31. OptoSigma - About Us
    · OptoSigma identifies its SIGMAKOKI relationship and stage/optomechanical product context. ([optosigma.com](https://www.optosigma.com/us_en/about-us))
32. 100.5cr Series Stage - Siskiyou Corporation
    · Siskiyou advertises the xx.xx.5cr stage as an identifiable catalog assembly. ([siskiyou.com](https://siskiyou.com/xx.xx-5cr-series-stage/))
33. SMR - Stoły mikrometryczne - Rollico
    · ROLLICO advertises SMR micrometer tables for positioning in one or more axes. ([rollico.com](https://www.rollico.com/pl/produkty/stoly-mikrometryczne/smr))
34. Standardversteller domiLINE, Breite 30 mm | IEF-Werner
    · IEF-Werner advertises domiLINE manual positioning assemblies with identifiable ordering routes. ([ief.de](https://www.ief.de/produkte/komponenten/manuelle-versteller/standardversteller/domiline-xx.xx))
35. Positioning systems with exact & play-free guides | norelem USA
    · norelem's catalog presents named positioning-stage and positioning-system families with commercial ordering routes. ([norelemusa.com](https://www.norelemusa.com/en-us/Product-Overview/Systems-and-components-for-machine-and-plant-construction/xx.xx/Positioning-systems/c/xx.xx))
36. Single Axis Tilt Stage 850-0040 | EKSMA Optics
    · EKSMA's product presentation identifies the single-axis tilt-stage offering, supporting a specific manual angular-adjustment comparison. ([eksmaoptics.com](https://www.eksmaoptics.com/p/single-axis-tilt-stage-xx.xx-xx.xx/xx.xx))
37. Mad City Labs - Products
    · Mad City Labs advertises piezo nanopositioning and manual/automated micropositioning products, including custom/OEM options. ([madcitylabs.com](https://www.madcitylabs.com/products.html))
38. One Axis - Piezosystem
    · piezosystem jena advertises identifiable single-axis piezo stages. ([piezosystem.com](https://www.piezosystem.com/products/piezo-actuators-and-stages/stages/one-axis/))
39. High-Speed Piezo Stages for Faster Precision Motion
    · Queensgate's commercial portfolio lists NPS-series piezo positioning stages, establishing a distinct product proposition within its documented brand relationship. ([nanopositioning.com](https://www.nanopositioning.com/product-range/nanopositioning-piezo-stages/high-speed-high-performance-stages))

40. CoreMorrow Product Introduction

    · CoreMorrow's company-authored product introduction lists piezo nanopositioning, scanning, and translation-stage categories; it is not confirmation of every named model's present supply. ([pub-mediabox-storage.rxweb-prd.com](https://pub-mediabox-storage.rxweb-prd.com/exhibitor/document/exh-418eb115-08bb-47e7-b16d-26a5d3e6f5d9/b6062269-4f99-xx.xx-xx.xx-ebeaea2740cb.pdf))

41. Piezo stages - Cedrat technologies

    · Cedrat Technologies lists X, XY, and XYZ piezo stages as commercial product offerings. ([cedrat-technologies.com](https://cedrat-technologies.com/categorie-produit/piezo-actuators/piezo-stages-piezo-actuators/))

42. BIO3 - Piezoconcept store

    · PIEZOCONCEPT's store advertises BIO3 as a three-axis nanopositioner with a commercial inquiry route. ([piezoconcept-store.squarespace.com](https://piezoconcept-store.squarespace.com/xx.xx-axis/p/bio3))

43. L2_ XY-Stages, Aperture - nanoFaktur

    · nanoFaktur lists aperture XY stages and integrated-Z alternatives, supporting configuration-specific specialist comparison. ([nanofaktur.com](https://nanofaktur.com/en/produkt/l2_-xy-stages-xx.xx-xx.xx%C2%B5m-aperture/))

44. Mechonics AG: Positioners

    · mechOnics catalogs compact identifiable positioners and multi-axis possibilities with inquiry routes. ([mechonics.de](https://www.mechonics.de/products/positioners/))

45. MM-3M-ST Linear | National Aperture

    · National Aperture advertises the named MM-3M-ST miniature motorized linear-stage assembly. ([nationalaperture.com](https://www.nationalaperture.com/products/motion/motorized/MM-3M-ST/))

46. Positioners | MICRONIX

    · MICRONIX maintains an identifiable commercial positioner catalog, supporting a compact-positioner inquiry route. ([micronixusa.com](https://micronixusa.com/catalog?category=positioners))

47. USB XYZ Stage - Picard Industries

    · Picard Industries advertises a complete USB XYZ stage package. ([picardindustries.com](https://picardindustries.com/products/multi-axis-motions/usb-xyz-stage/))

48. Motion Products & Nano-Positioning Systems - SmarAct

    · SmarAct lists linear, rotary, goniometer, and positioning-system offerings with specialized-environment categories. ([smaract.com](https://www.smaract.com/en/motion/products))

49. Cryo Stage 02 - JPE

    · JPE advertises Cryo Stage xx.xx as a configurable complete positioning assembly with option-specific supply distinctions. ([jpe-innovations.com](https://www.jpe-innovations.com/cryo-uhv-products/cryo-stage-xx.xx/))

50. Stages for E-Beam & Ion Beam | NANOMOTION

    · Nanomotion advertises multi-axis stages for e-beam and ion-beam chambers through a quotation route. ([nanomotion.com](https://nanomotion.com/product/stages-for-e-beam-ion-beam/))

51. Air Bearing Products | OAV

    · OAV catalogs motorized rotary stages and pre-integrated linear offerings alongside bearing components, requiring separation of component and assembly scope. ([oavco.com](https://www.oavco.com/products))

52. Linear Stage - Linear Motion Systems - H2W Technologies

    · H2W Technologies advertises guided linear-stage offerings, including voice-coil positioning assemblies. ([cdn.h2wtech.com](https://www.cdn.h2wtech.com/page/linear-stages))

53. VCS-10 Voice Coil Linear Stage

    · Equipment Solutions advertises the VCS-xx.xx/VCS-xx.xx guided voice-coil linear-stage assembly. ([equipsolutions.com](https://www.equipsolutions.com/products/linear-stages/vcs-xx.xx-voice-coil-linear-stage/))

54. 3D/4D Stage - ASI

    · ASI's 3D/4D offering combines linear stages with optional rotation, establishing an assembled positioning-package route. ([asiimaging.com](https://www.asiimaging.com/products/stages/stages-assemblies/3d-4d-stage/))

55. Motorized Z-Axes - Märzhäuser Wetzlar
    · Märzhäuser Wetzlar advertises motorized Z-axis offerings for microscopy. ([products.marzhauser.com](https://products.marzhauser.com/en/data/motorized-z-axes-c5696))
56. Stages & Translators | Sutter Instrument
    · Sutter advertises moving-stage and microscope-translation products, supporting a distinction between the moving assemblies purchased. ([sutter.com](https://www.sutter.com/stages))
57. Add-on motorized xy-stage for upright microscope - Sensapex Shop
    · Sensapex's store offers an add-on motorized XY-stage package for an upright microscope with a quotation route. ([sensapex.com](https://sensapex.com/shop/product/motorized-ums-stage-including-installation-bridge/))
58. Scientifica Universal Motorised Stage
    · Scientifica advertises its Universal Motorised Stage as a separately offered XY translation-stage product. ([scientifica.uk.com](https://www.scientifica.uk.com/products/scientifica-universal-motorised-stage))
59. Precision Positioning & Motion Systems | SCHNEEBERGER
    · SCHNEEBERGER advertises engineered-to-order positioning and motion systems for equipment customers, distinct from guide components alone. ([schneeberger.com](https://www.schneeberger.com/en/us/products/precision-positioning-systems-motion-systems/))
60. PM - Product Overview
    · PM B.V.'s product overview presents positioning stages and engineered motion systems. ([pm.nl](https://www.pm.nl/media/xx.xx/download/Product%20overview.pdf?v=xx.xx))
61. High-precision Positioning Products - LAB Motion Systems
    · LAB Motion Systems lists linear, rotary, XY, gantry, and planar stages with OEM/custom routes. ([labmotionsystems.com](https://www.labmotionsystems.com/products/))
62. High-Performance XY Systems | JAT
    · JAT advertises customer-specific XY positioning systems for equipment applications. ([jat-gmbh.de](https://www.jat-gmbh.de/en/products/mechatronic-systems/multi-axis-systems/xy-systems))
63. Precision Tables - Semiconductor | Yaskawa
    · Yaskawa's Israeli business advertises customized precision-positioning stages and a quotation route. ([yaskawa.co.il](https://yaskawa.co.il/en/product/precision-positioning-stages))
64. About PBA Systems
    · PBA Systems describes proprietary stages and custom-integrated positioning platforms within its commercial business. ([pbasystems.com.sg](https://www.pbasystems.com.sg/about-pba-systems/))
65. Company | Dynamic Structures & Materials, LLC
    · Dynamic Structures and Materials describes custom precision-motion and stage projects, supporting a commissioned-supply comparison. ([dynamic-structures.com](https://www.dynamic-structures.com/company))
66. Custom Solutions | Reliant Systems, Inc.
    · Reliant Systems advertises custom OEM motion assemblies using linear, XY, rotary, Z-axis, and air-bearing stages. ([reliantsystemsinc.com](https://reliantsystemsinc.com/capabilities/custom-solutions))
67. Projects | MI Partners
    · MI-Partners presents sample-positioning and precision-stage projects as prototypes and one-of-a-kind customer development. ([mi-partners.nl](https://www.mi-partners.nl/projects))
68. Miniature Stages - Akribis Systems
    · Akribis advertises miniature direct-drive positioning stages as commercial assemblies. ([akribis-sys.de](https://www.akribis-sys.de/en/produkte/xx.xx/miniature-stages/))
69. Motion Components for Automation | Jenny Science AG
    · Jenny Science lists integrated linear stages, linear slides/axes, and rotary-stage products. ([jennyscience.com](https://www.jennyscience.com/en/products))

70. SINADRIVES Direct Drive and linear motor stage experts
· SINADRIVES describes manufacture and assembly of linear-motor stages and guided axis systems. ([sinadrives.com](https://sinadrives.com/en/about-us/))
71. Standorte | Föhrenbach
· Föhrenbach's locations record identifies rotary-table and complete-system activities. ([foehrenbach.com](https://foehrenbach.com/unternehmen/standorte))
72. Motorized XY Stages & XY Translation Tables | OES
· Optimal Engineering Systems advertises motorized XY stages and translation tables. ([oesincorp.com](https://www.oesincorp.com/motorized-linear-stages/xy-axis-positioning.htm))
73. Intellidrives XYZR Positioning System
· IntelLiDrives advertises a named combined translation, lift, and rotary positioning assembly. ([intellidrives.com](https://www.intellidrives.com/linear-rotary-combination-c-xx.xx.html/XY-Lift-Rotary-Systems/XYZR-LSMA-100x100-MLVT70-xx.xx-RTHM151))
74. Optical Alignment & Semiconductor Positioning Modules | GMT GLOBAL
· GMT GLOBAL advertises alignment-stage modules and a hexapod positioning platform. ([gmtglobalinc.com](https://www.gmtglobalinc.com/en/module))
75. Multi-stage series - Chieftek Precision
· Chieftek lists multi-axis alignment stages, XY-theta tables, and other combined positioning assemblies. ([chieftek.com](https://chieftek.com/products/multi-stage-series/))
76. Motion - MultiFields Tech.
· MultiFields advertises piezo-motion, microscope-stage, and multi-axis platform categories. ([multifields.com](https://www.multifields.com/en/motion/))
77. Sanying MotionControl Instruments Ltd
· Sanying's catalog lists nanopositioning, air-bearing, and motorized positioning-stage categories. ([en.symc-tec.com](https://en.symc-tec.com/project.html))
78. Company Profile and History | COMS
· COMS identifies development, manufacture, and sale of automatic positioning stages and fully customized positioning equipment among its business activities. ([coms-corp.co.jp](https://coms-corp.co.jp/profile/history/))
79. isel - Linear Units
· isel's LES catalog describes guided axes and cross-table configurations, supporting identifiable assembly comparison without treating the whole machine as a stage. ([isel.com](https://www.isel.com/t3web/fileadmin/user_upload/Kataloge/20260317_Katalog_LES-Linear-units_en.pdf))
80. Multi Axis System - Bosch Rexroth Africa
· Bosch Rexroth Africa advertises multi-axis positioning systems through its regional business. ([boschrexroth.africa](https://boschrexroth.africa/en/multi-axis-system))
81. Linear Cartesian System - FUYU
· FUYU advertises Cartesian positioning assemblies and motorized XY/XYZ systems. ([fuyumotion.com](https://www.fuyumotion.com/linear-cartesian-system/))
82. Compact Linear Actuators - PBC Linear
· PBC Linear offers compact guided assemblies with motor, manual, and customer-drive alternatives. ([pbclinear.com](https://pbclinear.com/collections/compact-series-linear-actuator))
83. Linear Slides | Thomson
· Thomson advertises preassembled positioning-slide families and custom multi-axis system options. ([thomsonlinear.com](https://www.thomsonlinear.com/en/products/linear-motion-systems/about-linear-slides))
84. Linear Slides - 300 Series | Helix Linear Technologies
· Helix advertises complete rod-guided linear-slide assemblies within its commercial catalog. ([helixlinear.com](https://www.helixlinear.com/linear-guidance/linear-slides-xx.xx-series))

85. Single Axis Actuator | TBI Motion
    - TBI MOTION advertises integrated guided single-axis actuators, supporting assembly-level rather than screw-only commercial participation. ([tbimotion.com.tw](https://www.tbimotion.com.tw/en/category/single-axis-actuator))
86. Lineer Serisi | Doğuş Kalıp
    - Doğuş Kalıp catalogs identifiable linear modules and separately presents screw-, belt-, and rack-driven module systems. ([doguskalip.com.tr](https://www.doguskalip.com.tr/Urunler/xx.xx/lineer-serisi))
87. GHPC - Atuadores Guiados
    - GHPC's official catalog lists named compact and linear translation-table products, including CXH and CXS. ([ghpc.com.br](https://www.ghpc.com.br/produtos/atuadores/atuadores-guiados))
88. Electric slides EGSK - Festo
    - Festo's EGSK catalog presents electric slides and multi-axis assembly options. ([festo.com](https://www.festo.com/media/catalog/204385_documentation.pdf))
89. Linear axis - Güdel
    - Güdel advertises modular linear axes and multi-axis gantries, requiring comparison of the identifiable positioning assembly rather than the entire automation system. ([gudel.com](https://www.gudel.com/products/linearaxis))
90. Guias Lineales MiniTec
    - MiniTec's catalog describes guided modules and ready-to-install positioning packages with drive and control units. ([minitec.es](https://www.minitec.es/wp-content/uploads/2022/xx.xx/Guias-Lineales-MiniTec.pdf))
91. Linear technology - RK Rose+Krieger
    - RK Rose+Krieger's portfolio identifies linear units within its commercial linear-technology offering, without establishing every quoted stage package. ([rk-rose-krieger.com](https://www.rk-rose-krieger.com/english/products/linear-technology))
92. MESA COORDENADA MR-25 - Manrod Quality Machines
    - Manrod advertises MR-xx.xx coordinate tables as identifiable commercial accessories, resolving the absence of a named official offering lead. ([manrod.com.br](https://manrod.com.br/product/mesa-coordenada-xx.xx/))
93. PROXXON - KT 150
    - Proxxon's official portfolio advertises KT xx.xx as a compound table, supporting assembly-level comparison separately from the host machine. ([proxxon.com](https://www.proxxon.com/en/micromot/xx.xx.php))
94. Vertex Precision Cross Table VCT-820 - Accusize
    - Accusize's own store offers a VERTEX-branded VCT-xx.xx cross table; this establishes the retailer's offer, not the complete manufacturer/legal-seller allocation. ([accusizetools.com](https://accusizetools.com/en-us/products/precision-cross-table-vct-xx.xx))
95. Mesa indexadora rotativa M140 | Posibras
    - Posibras advertises M140 rotary indexing tables for incorporation into industrial equipment. ([posibras.com](https://posibras.com/produtos/m140))
96. Döner Tablalar | Nikken
    - NIKKEN's Turkish portfolio lists CNC rotary-table alternatives, establishing an advertised industrial-table route rather than local manufacture or completed sales. ([nikken.com.tr](https://www.nikken.com.tr/urunler/doner-tablalar))
97. TAVOLE ROTANTI TMT - Poletti Macchine Utensili SRL
    - Poletti markets TMT rotary tables, while the complete manufacturer/brand allocation remains unsettled. ([studio-poletti.it](https://www.studio-poletti.it/prodotti/tavole-rotanti-tmt/))
98. Mesas de Translação e Fixação | Instron
    - Instron separately catalogs translation-and-clamping positioning stages within its equipment-accessory offering. ([instron.com](https://www.instron.com/pt-br/products/testing-accessories/electronics-and-microelectronics-testing-systems-and-accessories/translation-clamping-stages/))

99. Mesa Posicionadora - Dgrande

· Dgrande advertises customized positioning tables for industrial workstation applications, leaving the independently supplied assembly and acceptance boundary to agreement. ([dgrande.com.br](https://dgrande.com.br/produto/mesa-posicionadora/))

100. Lexium TAS | Schneider Electric USA

· Schneider Electric's Lexium TAS page describes linear tables with movable carriages and fixed axes; a range description does not establish model-specific lifecycle or delivery. ([se.com](https://www.se.com/us/en/product-range/xx.xx-lexium-tas/))

101. X Translation Stage - Opto Electronics

· Opto Electronics advertises an identifiable X-translation-stage offering. ([oeplindia.com](https://oeplindia.com/stages/x-translation-stage.php))

102. Products - Crescent Components and Systems

· Crescent lists translation stages in its commercial catalog, without fully resolving the original-manufacturing versus resale role. ([crescentcomponents.com](https://www.crescentcomponents.com/products.html))

103. TECSCI - Product Catalog

· TECSCI's authored catalog identifies its Argentine commercial context and lists LSXXX linear tables with controllers. ([cdnc.heyzine.com](https://cdnc.heyzine.com/files/uploaded/v2/ff74332a6dd6df01f77c0332f5e946d9e5adecd2.pdf))

104. Linear Stage - Lishui Yongrun Precision Machinery Co., Ltd.

· Lishui Yongrun's official catalog advertises linear, motorized, and multi-axis stage offerings; general export promotion does not establish destination-specific support. ([lsyongrun.com](https://www.lsyongrun.com/linear-stage/))

105. Square Rotary Manual XYZ Linear Stage - Shenzhen Luckym

· Shenzhen Luckym advertises manual XY/XYZ positioning tables through its commercial product page. ([luckymfc.com](https://www.luckymfc.com/sale-xx.xx-square-rotary-manual-xyz-linear-stage-precision-xy-table-micrometer-feed-type.html))

106. About Us - Winner Optical (Suzhou) Automation Equipment Co., Ltd.

· Winner Optics advertises manual, motorized, and alignment-stage categories under differing business-name presentations. ([winneroptics.com](https://winneroptics.com/about-us/))

107. About Us - MPositioning Co., Limited

· MPositioning advertises broad manual and motorized positioning categories; the live commercial description does not alone settle present legal continuity. ([mpositioning.com](https://www.mpositioning.com/pages/about-us))

108. 高精度卧式转台 - 吉林光驰科技有限公司

· 吉林光驰科技有限公司 advertises an identifiable motorized rotary-stage product under its own business presentation. ([guangchikeji.com](https://www.guangchikeji.com/index.php?c=show&id=xx.xx))

109. 产品展示 - 浙江零振智能装备有限公司

· 浙江零振智能装备有限公司's product presentation includes positioning-stage categories alongside vibration-control offerings; it does not settle a particular delivered configuration. ([zerovib.cn](https://www.zerovib.cn/Product.aspx?Typeid=xx.xx))

110. Positioners | Luminos

· Luminos advertises CORALIGN positioners in manual, automated, and semi-automated formats. ([luminos.com](https://www.luminos.com/positioners))

111. Elliot Products

· Elliot Scientific presents Elliot|Martock flexure/alignment products, custom/OEM supply, and a subsidiary manufacturing relationship. ([elliotscientific.com](https://www.elliotscientific.com/Elliot-Products))

112. 5101.30 - xHuber
    - HUBER advertises Linear Stage xx.xx and multi-axis configuration possibilities through a commercial inquiry route. ([xhuber.com](https://www.xhuber.com/en/products/xx.xx-components/xx.xx-translation/linear-stage/xx.xx/))
113. LG Series from LG Motion
    - LG Motion states that its LG series positioning tables are manufactured in its own factory and supplied for scientific and industrial use. ([lg-motion.co.uk](https://www.lg-motion.co.uk/products/lg-series/))
114. Attuatori Lineari per l'automazione - Elcam
    - Elcam advertises linear systems and precision XYZ tables without resolving proprietary manufacture versus third-party distribution. ([elcam.it](https://elcam.it/prodotti-e-soluzioni/attuatori-lineari/))
115. Gilman Precision - Slides Catalog
    - Gilman Precision's slides catalog documents complete positioning-slide assemblies and manual/multi-axis options. ([gilmanprecision.com](https://gilmanprecision.com/pdfs/Slides-Catalog.pdf))
116. LabJack XTREME-Z-6 | Labjacks.com
    - Labjacks.com advertises an identifiable laboratory height-positioning assembly, supporting a distinct manual positioning purchase rather than motorized-axis equivalence. ([labjacks.com](https://labjacks.com/xtreme-z-xx.xx/))

22.5. Benchmarking Analysis, 2025

The defensible benchmark is the purchasing requirement and responsibility transferred. Zaber's ASR alternatives, Xeryon's bundled development kits, and New Scale Technologies' embedded modules form a useful control-packaging comparison, but not a common performance peer group. [redacted]

Published service conditions can be more consequential than a wider catalog. [redacted] General international presence is not a substitute for those terms.

[redacted] A buyer should require a quotation tied to the relevant variant and destination. Standard-environment procurement remains a meaningful alternative when specialized coverage is unnecessary; specifying broader conditions without an applicable supplier commitment can narrow the shortlist without resolving responsibility.

RESEARCH SAMPLE REPORT

Legacy-family continuity requires a different benchmark from catalog breadth. [redacted] Buyers maintaining installed equipment should obtain the successor seller, supported replacement configuration, and repair responsibility before authorizing a redesign or assuming continuity.

Manufacturing attribution is especially important when comparing catalog and regional routes. [redacted] A buyer should not treat a local address, catalog brand, or published warranty as proof of origin or an enforceable manufacturer relationship.

Scientific-facility projects provide a different commercial benchmark from repeatable catalog supply. [redacted] Facility buyers should distinguish commissioned-system acceptance from a separately supplied positioning assembly and obtain the continuing support boundary for the actual contract.

Component and corporate records also have limited comparison scope. RBC Bearings' historical PIC Design acquisition does not establish a current named complete-stage offer. [redacted]

Some industrial and intermediary alternatives still require a sharper delivered-product boundary. For Positech Ltd., a current externally supplied complete-stage package and responsible group seller remain unsettled. [redacted]

[redacted]

Several captured identities cannot yet support a like-for-like current-package comparison. [redacted] Their retained identities do not establish absence or equivalence.

Legal identity and assembly-level commitment remain material for additional regional leads. JAEWON Co., Ltd.'s government-hosted company profile identifies a precision-stage business, but a named current package still requires confirmation. [redacted]

[redacted] Their products should not be discounted because detailed profiles are absent, nor promoted as substitutes solely from broad portfolio descriptions. The same rule applies across the shortlist: a comparable quotation must identify the assembly, responsible seller, included control and feedback package, operating environment, acceptance boundary, and continuing support.

Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   · ASR provides a control-packaging comparison point, without establishing equivalent performance or application acceptance across series. ([zaber.com](https://www.zaber.com/products/families/ASR))
2. Motorized Stage Control for the Electron Ion Collider's Detection of Internally Reflected Cherenkov Light Detector's Quartz Bar Quality Assurance Data Acquisition Program
   · The institutional installation is counterevidence to assuming a uniform control package throughout one installation; it does not establish broader buyer preferences. ([jlab.org](https://www.jlab.org/sites/default/files/dsg/notes/2025-xx.xx.pdf))

3. Aerotech Warranty and Service Policy
   · Aerotech's published warranty policy makes field attendance conditional and distinguishes additional service arrangements from a general support presence. ([aerotech.com](https://www.aerotech.com/warranty-and-service-policy/))
4. WARRANTY | SURUGA SEIKI CO., LTD.
   · Suruga's warranty contains specified application exclusions and a delivery-country/area restriction, supporting transaction-specific coverage verification rather than a service ranking. ([eng.surugaseiki.com](https://eng.surugaseiki.com/warranty/))
5. Nanopositioners - nanopositioning made simple
   · The environment-specific portfolio supports variant-level comparison rather than universal environmental equivalence. ([attocube.com](https://www.attocube.com/en/products/nanopositioners))
6. Development Kits for Piezo Stages & Actuators | Xeryon
   · The bundled kit provides a packaging comparison, not proof of production support or finished-instrument acceptance. ([xeryon.com](https://xeryon.com/products/development-kits/))
7. Linear Micro Stages - New Scale Technologies
   · Embedded electronics establish package scope, not application acceptance or a universal performance peer group. ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))
8. New Scale Technologies, Inc. - Terms and Conditions, Revision 05.06.2025
   · The terms support separating supplied-module conformity from broader instrument-level acceptance obligations. ([newscaletech.com](https://newscaletech.com/wp-content/uploads/NewScale-Terms-Conditions_2025.pdf))
9. 125mm, Center Drive, Thru-Hole, Metric Micrometer Stage
   · This item-specific origin/importer distinction supports requiring product-level attribution rather than inferring origin from local catalog presence. ([edmundoptics.in](https://www.edmundoptics.in/p/125mm-center-drive-thru-hole-metric-micrometer-stage/xx.xx/?PrintPDF=true))
10. Instrument design - European XFEL
    · The facility record establishes a specific stage attribution, not present repeatable catalog supply or the complete current supplier relationship. ([xfel.eu](https://www.xfel.eu/facility/instruments/fxe/instrument_design/index_eng.html))
11. SMR - Stoły mikrometryczne - Rollico
    · The commercial table listing does not establish the original manufacturer or the complete manufacturing-versus-resale allocation. ([rollico.com](https://www.rollico.com/pl/produkty/stoly-mikrometryczne/smr))
12. Motion Products & Nano-Positioning Systems - SmarAct
    · Separate environmental categories do not establish identical combined coverage for every offering. ([smaract.com](https://www.smaract.com/en/motion/products))
13. Cryo Stage 02 - JPE
    · The configurator supports a quotation-specific environmental and feedback comparison rather than family-wide equivalence. ([jpe-innovations.com](https://www.jpe-innovations.com/cryo-uhv-products/cryo-stage-xx.xx/))
14. Stages for E-Beam & Ion Beam | NANOMOTION
    · The chamber-stage offering establishes a specialized commercial alternative, not identical scope to other suppliers' environmental packages. ([nanomotion.com](https://nanomotion.com/product/stages-for-e-beam-ion-beam/))
15. About Us - Winner Optical (Suzhou) Automation Equipment Co., Ltd.
    · The business-name presentations do not independently settle the legal contracting operator behind a quoted stage. ([winneroptics.com](https://winneroptics.com/about-us/))
16. About Us - MPositioning Co., Limited
    · The website's claimed business identity requires confirmation of the legal contracting operator before reliance on a supply obligation. ([mpositioning.com](https://www.mpositioning.com/pages/about-us))

17. 高精度卧式转台 - 吉林光驰科技有限公司

    · The product record establishes an advertised offering, not destination-specific support or the terms of an individual configuration. ([guangchikeji.com](https://www.guangchikeji.com/index.php?c=show&id=xx.xx))

18. 产品展示 - 浙江零振智能装备有限公司

    · The product categories support a positioning-stage inquiry while leaving named configuration, seller documentation, and destination support to confirmation. ([zerovib.cn](https://www.zerovib.cn/Product.aspx?Typeid=xx.xx))

19. Attuatori Lineari per l'automazione - Elcam

    · The commercial offering supports an inquiry route but requires offering-level manufacturer attribution. ([elcam.it](https://elcam.it/prodotti-e-soluzioni/attuatori-lineari/))

20. CHPS High Precision Linear Motor Driven Stage Selection Guide

    · The official CHPS guide establishes historical Rockwell/Anorad stage participation, not present product availability or successor responsibility. ([literature.rockwellautomation.com](https://literature.rockwellautomation.com/idc/groups/literature/documents/sg/chps-sg001_-en-p.pdf))

21. Sophisticated Control Stage - tau Linear Stage Catalog

    · The CKD Nikki Denso tau catalog documents a stage portfolio but does not establish present supply of every retained model. ([nikkidenso.co.jp](https://www.nikkidenso.co.jp/catalog/dl/tau-linear_stage_english_201107_rev1.pdf))

22. BioPrecision2ex - Extended Travel Motorized Stages

    · Ludl's historical BioPrecision2ex brochure establishes a documented stage family without confirming present manufacturer-supported availability. ([ludl.com](https://ludl.com/wp-content/uploads/2015/xx.xx/BioPrecision2-Extended-2009-press.pdf))

23. Motion Control Series 1: Open Loop vs Closed Loop Motors

    · The Hyland/Ealing motion document establishes historical stage offering context, not present orderability or the current responsible seller. ([ealingcatalog.com](https://www.ealingcatalog.com/media/wysiwyg/LearningCenter/Motion_Control_1_-_Open_Loop_Vs_Closed_Loop_REV2.pdf))

24. Ludl Electronics Products - Micro Video Instruments

    · Micro Video Instruments advertises Ludl stage products; this is a channel offer, not confirmation of manufacturer authorization, current replacement scope, or continuing support. ([mvi-inc.com](https://www.mvi-inc.com/products/microscopy-accessories/motorized-accessories/ludl-electronics-products/))

25. Catalog - Ascential Medical & Life Sciences

    · Ascential's catalog associates commercial listings with the Primatics brand without independently settling the current legal seller and replacement commitment. ([ascentialmls.com](https://ascentialmls.com/catalog/?product_brand=primatics))

26. AMA Distributed Products List

    · Automated Micron Assembly lists NUTEC Components among represented precision-positioning businesses; the list does not establish a named currently supplied stage or legal continuity. ([amaasia.net](https://www.amaasia.net/AMA%20Distributed%20Products%20List%xx.xx%28Latest%xx.xx.pdf))

27. Linear Stages | Myostat Motion Control

    · Myostat lists guided positioning assemblies with motor mounts, without settling original manufacture, integration, private-label, or resale attribution. ([myostat.ca](https://www.myostat.ca/linear-stage))

28. Precision Systems for Synchrotrons | IRELEC

    · IRELEC describes a detector-positioning system supplied for a named SOLEIL beamline, supporting a facility-system role rather than automatic standalone-stage equivalence. ([irelec-alcen.com](https://www.irelec-alcen.com/precision-systems-for-synchrotrons/))

29. About Us - Instrument Design Technology

    · Instrument Design Technology describes external beamline-system and component supply, without establishing a specific current standalone stage package. ([idtnet.co.uk](https://www.idtnet.co.uk/about.html))

30. Ultraprecision Mechanics - Kugler Precision

· Kugler describes precision-mechanics activities and stage-related experience, not a currently separable complete-stage supply commitment. ([kugler-precision.com](https://kugler-precision.com/en/ultraprecision/ultrapecision-mechanics))

31. Positioning Systems - Hikade Technologies

· Hikade's positioning-system presentation qualifies platform projects by development or concept status, preventing an assumed current delivery commitment. ([hikade.cz](https://www.hikade.cz/positioning-systems))

32. RBC Bearings Completes the Acquisition of Precision Industrial Components LLC

· RBC's announcement establishes a historical PIC Design asset acquisition, not a current named complete-stage offering or present seller allocation. ([investor.rbcbearings.com](https://investor.rbcbearings.com/news-releases/news-release-details/rbc-bearings-incorporated-completes-acquisition-precision))

33. Announcement of Legal Integration Measures Regarding Ewellix Entities

· Schaeffler's notice distinguishes its completed historical Ewellix acquisition from a planned entity merger; the notice does not confirm subsequent completion or identify a current stage seller. ([schaeffler.us](https://www.schaeffler.us/remotemedien/media/_shared_media_rwd/01_company_1/suppliers_4/supplier_information_management/supplier_information_ewellix_france_integration_schaeffler_en.pdf))

34. Braddick Engineering

· Braddick describes linear-motion products and equipment engineering, without establishing a named proprietary current stage commitment. ([braddickengineering.co.za](https://www.braddickengineering.co.za/))

35. YZ Gantry Systems Will Be Delivered to South Africa

· Tallman announces a YZ gantry project for South Africa; the announcement does not establish completed delivery or current continuing support. ([tallman-robotics.com](https://www.tallman-robotics.com/yz-gantry-systems-will-be-delivered-to-south-africa/))

36. 57BYG Stepper Motor - Jiangsu Wantai Motor Co., Ltd.

· Wantai's business presentation includes motors and generic linear-slide/module categories, without identifying the complete stage package needed for like-for-like comparison. ([wantmotor.com](https://www.wantmotor.com/hybrid-stepper-motor/xx.xx-phases-hybrid-stepper-motor/57byg-stepper-motor.html))

37. Avesta - Micromachining Datasheet

· Avesta's scanner document explicitly excludes translation tables from that package, leaving separate stage supply unresolved. ([avesta.ru](https://avesta.ru/wp-content/uploads/pdf/white/7_Micromachining_datasheet.pdf))

38. JAEWON Co., Ltd. - Company Profile

· JAEWON's government-hosted commercial profile identifies precision positioning stages as its business offering, without settling a named current delivered package. ([ijaewon.gobizkorea.com](https://ijaewon.gobizkorea.com/mini/site/companyProfile.do))

39. Encoders for precision stages | Renishaw

· Renishaw identifies JUSTEK in a component-supplier relationship involving precision-stage encoders; that relationship does not establish current availability of a particular JUSTEK stage. ([info.renishaw.com](https://info.renishaw.com/Encoders-PrecisionStages))

40. □□□□□□□□□□ □□□□□ □□□□□ □ □□□□□□□□ - □□□□ □□□□□□□

· □□□□ □□□□□□□ advertises a laboratory-supply business; its general presentation does not settle the legal operator or manufacturing/trading allocation for a named stage. (3etop.ir)

23. Company Profiles

23.1. Aerotech

Aerotech presents distinct purchasing routes for catalog stages, commissioned motion subsystems, and turnkey automation. ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪ ▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ The distinction is the responsibility purchased: ordering a stage does not automatically transfer responsibility for the surrounding machine.

▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ ▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪ This makes it a candidate when a buyer wants motion engineering and continuing support through one supplier relationship, provided the quotation defines interfaces, application acceptance, and service coverage. Catalog procurement remains an alternative for buyers retaining integration capability; commissioning a broader subsystem may reduce coordination work but concentrates subsequent changes within the agreed supplier package.

Global support is not unrestricted on-site coverage. Aerotech's warranty policy makes field attendance conditional and requires a purchase order covering transportation and subsistence; expedited repair also requires approval. ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪ ▪▪▪ ▪▪▪▪▪▪▪▪▪▪▪▪▪ ▪▪▪▪▪▪▪▪

Sources & Evidence

1. About Us | Your Motion Control Partner
   - Aerotech distinguishes standard motion products, custom single-axis and multi-axis motion systems, engineering, implementation support, and turnkey automation offerings.
   - Company verification: Aerotech describes an operating, privately held precision-motion business with international facilities and representation.
   - Company verification: Its company history documents positioning-stage and engineered-motion-system activities.
2. High Performance Stages & Actuators | Aerotech
   - Aerotech's stage catalog lists PRO165SL ball-screw stages, ANT130XY two-axis stages, and ABRX rotary air-bearing stages, alongside single-axis and multi-axis stage offerings.
3. Solutions for Performance-Driven Machinery | Aerotech
   - Aerotech advertises custom engineering and implementation support and identifies service technicians and support engineers in Europe, Asia, and North America.
4. Aerotech Warranty and Service Policy
   - Aerotech makes on-site warranty attendance conditional and requires a purchase order covering transportation and subsistence; rush repair requires approval and a purchase order for the additional service.
5. Aerotech Modern Slavery Statement FY2026
   - Company verification: The FY2026 statement identifies Aerotech Inc. as the manufacturer of positioning tables, stages, and positioning systems.
   - Company verification: It distinguishes Aerotech Inc.'s manufacturing role from Aerotech Ltd.'s UK marketing and sales role.

6. Stage & Actuator Products | Aerotech
   - Company verification: Aerotech advertises linear and rotary positioning stages across single-axis and multi-axis configurations, including mechanical-bearing, air-bearing, and flexure-bearing offerings.

23.2. Physik Instrumente (PI) SE & Co. KG

Physik Instrumente (PI) SE & Co. ■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■ Buyers should distinguish purchasing positioning hardware from purchasing an alignment package: broader scope can consolidate motion and software responsibility, but architecture labels alone do not establish equivalent capabilities or compatibility.

■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■ An Equipment OEM should first establish whether a documented catalog variant meets its commercial requirements; otherwise, the requested modification needs an explicit quotation covering the delivered configuration and environmental scope. A general vacuum offering does not establish suitability for every model or combination of environments.

Delivery attribution also matters. ■■ ■■■■■■■■■■ ■■ ■■■■■■■ ■■■■■■■■■■■■ ■■ ■■ ■■■ ■■■■■ ■■■■■■■■■■■ ■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■ ■■■ ■■■■■■■■■■ ■■■■ ■■■■■■■■■■■ ■■ ■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■ ■■ ■■ ■■■■■ ■■■ ■■■■■ ■■■■■ ■■ ■■■■■■■■■ ■■■ ■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ Buyers should therefore identify the actual contracting and delivering entities rather than infer seller obligations from the parent relationship.

Sources & Evidence

1. About PI US: Custom Design & Service / Export Controlled Applications & ITAR Registered
   - PI identifies PI (Physik Instrumente) LP as its U.S. subsidiary and describes engineering and manufacturing operations in Shrewsbury and Nashua; this does not allocate every PI product to U.S. manufacture.
   - Company verification: PI's U.S. business page identifies PI (Physik Instrumente) LP as a PI Group subsidiary.
   - Company verification: It documents the November 2025 move to a new manufacturing and engineering center and continuing air-bearing, mechanical-stage, and nanopositioning activities.
2. Vacuum / UHV Compatible Stages - Linear & Rotary Positioners for Vacuum, Wide Temperature Ranges | PI USA
   - PI identifies vacuum-ready standard products for selected series and modifications available on request, supporting distinct catalog-variant and requested-modification supply routes.
3. Precision Motion Control Technologies | Positioning Systems
   - PI advertises hexapods, piezo-flexure stages, piezo-motor stages, air-bearing systems, and motorized linear and rotary positioners.
   - Its photonics-alignment portfolio includes automated hexapod alignment packages with controllers and software, establishing a broader advertised package than positioning hardware alone.
   - Company verification: PI's commercial portfolio includes linear and rotary positioning stages, piezo nanopositioning systems, air-bearing systems, and hexapod positioners.

4. HOERBIGER Completes Acquisition of PI: Dr. Michael Albiez Appointed New CEO
   - PI's May xx.xx 2026 announcement states that HOERBIGER completed the acquisition on March xx.xx 2026 after regulatory approvals and that PI would retain its name, brand, and independent operating identity.
   - Company verification: HOERBIGER completed its acquisition of Physik Instrumente on March xx.xx 2026, after regulatory approvals.
   - Company verification: PI retains its name, brand, and independent operating identity within HOERBIGER.
   - Company verification: The announcement identifies Physik Instrumente (PI) SE & Co. KG and its continuing international positioning business.
5. About | PI (Physik Instrumente)
   - Company verification: The official company page identifies Physik Instrumente (PI) SE & Co. KG and its Karlsruhe, Germany address.
6. Actuators | Horne Technologies South Africa
   - Company verification: Horne Technologies' South African portfolio advertises PI nanopositioning systems, hexapod robotics, and precision motion control.
   - Company verification: The page establishes a public regional marketing route, not independently confirmed channel authorization or completed stage sales.

23.3. Zaber

Zaber makes control-supply responsibility explicit in its ASR microscope-stage family. ASR and ASR-E are motor-only series, while X-ASR and X-ASR-E include controllers. ■■■ ■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■ ■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■ ■■■■■■■ ■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■

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Sources & Evidence

1. ASR Family - OEM Components XY XYZ Motorized Microscope Stages - Zaber
   - The ASR comparison distinguishes motor-only ASR and ASR-E series from controller-equipped X-ASR and X-ASR-E series.
   - The family advertises Nucleus modules, µManager support, and microscope mounting options; feature inclusion differs across series.

2. Locations and Contact - Zaber
   - Zaber lists Laser 2000 (UK) Ltd. as exclusive for Ireland and the United Kingdom, selected-product appointments for Edmund Optics and Digi-Key, and microscopy support through AVR Optics.
   - Some regions offer distributor access alongside direct manufacturer access to the full catalog.
   - Company verification: Zaber lists distributor routes in China, India, Japan, Singapore, South Korea, Taiwan, and Vietnam.
   - Company verification: Lists nonexclusive distributors serving Australia and New Zealand; these listings do not establish realized local sales.
3. About - Zaber
   - Company verification: Zaber identifies its operating business as Zaber Technologies Inc.
   - Company verification: It designs and manufactures precision-positioning devices and describes worldwide distribution and an integrated-product business model.
4. LRT Family - Linear Stages - Zaber
   - Company verification: Zaber advertises the LRT family of screw-driven linear stages, including built-in-controller and motor-only models.
   - Company verification: The product page describes direct North American pricing and distributor arrangements for other territories.

23.4. Dover Motion

[redacted] Its SmartStage XY combines stage mechanics with controller, drive, and feedback electronics, supported by motion software tools. This is a defined subsystem proposition for Equipment OEMs seeking to purchase motion electronics with the stage rather than source those elements separately.

Dover Motion reports that Cellerate selected SmartStage XY for incorporation into its assembly module. [redacted] The reported stage incorporation should not be interpreted as Dover Motion assuming responsibility for Cellerate's complete equipment.

Sources & Evidence

1. Automating Precision Assembly with the SmartStage XY
   - Dover Motion reports that Cellerate selected SmartStage XY for incorporation into its assembly module and attributes reduced external-control accommodation to onboard electronics.
   - The account establishes a supplier-reported example, not continuing contractual commitments or independent outcome verification.
2. SmartStage XY Linear Positioning Stage - Dover Motion
   - SmartStage XY is advertised with controller, drive, and feedback electronics integrated into the stage and with supporting software tools, establishing an integrated motion-subsystem offering.

3. About Us - Dover Motion
   - Dover Motion identifies itself as part of the Ralliant portfolio and advertises configurable linear and rotary stages and custom motion solutions.
   - Company verification: Dover Motion identifies itself as part of the Ralliant portfolio.
   - Company verification: Its current business page offers configurable linear and rotary stages and custom motion solutions for external customers.
   - Company verification: It describes an installed-product base across industrial and scientific applications.
4. SmartStage Ecosystem - Dover Motion
   - Company verification: Dover Motion advertises its SmartStage ecosystem of linear-motor stages, including SmartStage XY positioning stages with integrated control.

23.5. Suruga Seiki Co., Ltd.

Suruga Seiki Co., Ltd. explicitly separates motorized and motorless stage offerings. ■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■ ■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■■■■■■■■■■■ ■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■■■ ■■■■■ ■■■ ■■■■■■■ ■■■■ ■■■■■■■ ■■■ ■■ ■■■■■■■■ ■■■■■ ■ ■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■ Equipment OEMs should obtain the accepted motor and electronics scope before choosing this route over a motorized package.

■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■ ■■■ ■■ ■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■ ■■■■■■ These terms do not themselves establish a prohibition on sales into those settings, but buyers should obtain written clarification before relying on standard coverage or relocating equipment. An advertised stage configuration and its applicable warranty are different purchasing questions.

MISUMI identifies Suruga Seiki as a subsidiary, but the relationship does not allocate every MISUMI stage offering to Suruga. ■■■■■■■■ ■■■■■■■■ ■■■ ■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■ ■■■■■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■■■ Supplier comparisons and delivery commitments should retain the named brand, manufacturer, and seller rather than assign group activity wholesale to the subsidiary.

Sources & Evidence

1. Motorized Stage | SURUGA SEIKI CO., LTD.
   - Suruga's portfolio separately lists motorized and motorless linear, rotary, and goniometer stages, plus controllers and stepping-motor drivers.
   - These listings support comparison of advertised stage-supply packages without establishing accepted buyer-supplied motor arrangements.
   - Company verification: Suruga Seiki advertises motorized linear, goniometer, and rotary stages and corresponding motorless stage categories.

2. WARRANTY | SURUGA SEIKI CO., LTD.
   - Suruga's warranty excludes defects caused by specified medical diagnosis or treatment, aerospace, and military-related uses, among other restrictions.
   - It also excludes defects caused by use outside the country or area of delivery identified in the order confirmation.
3. At a Glance | MISUMI Group Inc.
   - MISUMI Group lists SURUGA SEIKI CO., LTD. among its major subsidiaries; the listing establishes affiliation rather than product-level manufacturing or selling allocation.
   - Company verification: MISUMI Group lists SURUGA SEIKI CO., LTD. among its major subsidiaries, establishing a group relationship relevant to consolidated attribution.
4. MISUMI Expands Automated Positioning Stage Production for Data Centers
   - MISUMI's January xx.xx 2026 announcement describes planned investment at group automated-positioning-stage manufacturing sites in China and Vietnam.
   - The announcement does not identify a product-level allocation to Suruga Seiki and therefore cannot establish the subsidiary's complete manufacturing or selling boundary.
   - Company verification: MISUMI Group's January xx.xx 2026 announcement describes its automated-positioning-stage manufacturing business and production expansion.
   - Company verification: This is group-level activity relevant to the retained Suruga reporting perimeter, not evidence that every MISUMI stage is sold by Suruga.

23.6. ETEL

[illegible] Its semiconductor and electronics portfolio includes CHARON2 stacked configurations, METIS planar platforms, and TELICA systems. CHARON2 offers predefined configurations and choices of standard electronics, giving equipment builders a modular procurement route rather than requiring the same integration scope for every order.

[illegible] Consolidation may simplify supplier coordination but creates greater reliance on the agreed package for changes and support. Buyers should define the included elements, tooling interfaces, acceptance boundary, and local service commitment; ETEL's interoperability claims are not independent proof of superior equipment outcomes.

Sources & Evidence

1. Motion System Overview - ETEL SA
   - ETEL presents individual axes, combined modules, stacked and planar platforms, and broader integration offerings for semiconductor and electronics equipment.
   - Named motion-system offerings include CHARON2, METIS, and TELICA.
   - Company verification: ETEL advertises linear and rotary axes, combined modules, stacked positioning systems, and planar platforms.
   - Company verification: Named offerings include CHARON2 and METIS stage platforms for external equipment builders.
2. CHARON2 - ETEL SA
   - CHARON2 is offered in predefined configurations ranging from individual axes to combined motion systems, with choices from ETEL's standard electronics.
3. Full forward integration - ETEL SA
   - ETEL's Full Forward Integration offer combines motion platforms with surrounding frames, isolation, electronics, and software; the page states that part or all of the listed elements may be supplied.
   - ETEL advertises support through local Electronics Competence Centers; claimed interoperability remains a supplier claim.
4. Company - ETEL SA
   - ETEL identifies ETEL S.A. as part of the HEIDENHAIN Corporate Group and describes its motion-system and motion-control business.
   - Company verification: ETEL identifies ETEL S.A. as part of the HEIDENHAIN Corporate Group.
   - Company verification: Its company record describes continuing precision-motion-system operations and distribution through the HEIDENHAIN sales network.

23.7. attocube

attocube separates Low Temperature Nanopositioners from Ambient and Vacuum Nanopositioners and advertises linear, rotary, goniometric, and customized integrated positioning solutions. Its low-temperature portfolio addresses cryogenic, magnetic-field, and vacuum environments. ■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■ ■■■■■■ ■■■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■ ■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■■

The loan service provides a different commercial engagement: its kits use the EC*xx.xx product line for ambient conditions and include an AMC100 controller, integration documents and software, and advisory support. The advertised loan period is up to two weeks. ■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■■■■■ ■■ ■■■ ■■■■■■ ■■■ ■■■■■■ ■■■ ■■ ■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■ ■ ■■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■ ■ ■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■ ■■■■■■ ■■■ ■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■■

Sources & Evidence

1. Loan Service for Nanopositioners
   - attocube's loan kits use EC*xx.xx positioners for ambient conditions and include an AMC100 controller, documents, software, and integration advice.
   - The advertised loan period is up to two weeks; this service does not establish specialized-environment purchasing acceptance.
2. Nanopositioners - nanopositioning made simple
   - attocube separately advertises Low Temperature Nanopositioners and Ambient and Vacuum Nanopositioners, with linear, rotary, goniometric, and customized integrated positioning offerings.
   - Its low-temperature category addresses cryogenic, magnetic-field, and vacuum environments without establishing universal model equivalence.
   - Company verification: attocube advertises linear, rotary, and goniometric nanopositioners, scanners, and integrated multi-axis positioning solutions.
3. attocube company structure - pioneering partners in innovation
   - Company verification: The company-structure page identifies attocube systems GmbH in Haar, Germany.
   - Company verification: It establishes attocube's membership in the WITTENSTEIN group and its nanotechnology business role.

23.8. Prior Scientific Instruments Ltd.

[illegible] The ProScan name therefore does not establish a common feedback package across every model. Direct Operators replacing or automating a microscope stage should match the exact instrument, stage, and control scope rather than select by family name alone.

Prior also advertises stage customization and OEM services, providing an alternative when the standard compatibility listing does not cover the instrument. An OEM should compare a documented catalog fit with a separately agreed custom commitment, including the supplied controls and support responsibility. [illegible]

Brand attribution affects competitive interpretation. Prior identifies Queensgate as a Prior Scientific brand, and its legal notice lists Queensgate alongside ProScan and OptiScan trademarks. [illegible]

Sources & Evidence

1. Motorized XY Microscope Stages | High-Precision Positioning
   - Prior lists ProScan and OptiScan stages for specified microscope families and advertises stage customization and OEM services.
   - The catalog identifies business locations in the United Kingdom, United States, Germany, Japan, and China, without establishing identical contractual service obligations.
   - Company verification: Prior Scientific advertises named ProScan and OptiScan motorized XY microscope-stage products.
   - Company verification: The page identifies Prior Scientific Instruments Ltd. and commercial locations in the United Kingdom, United States, Germany, Japan, and China.
2. ProScan H100AX Compact Microscope Stage | Prior Scientific
   - Prior's H100AX product page lists Zeiss Axioexaminer, Axioimager xx.xx and Axioimager xx.xx compatibility and specifies no encoder, supporting model-specific rather than family-wide comparison.
3. Queensgate awarded funding for fourth research project with NPL
   - Prior's January xx.xx 2024 announcement explicitly describes Queensgate as a Prior Scientific brand, supporting common-business attribution rather than independent-supplier treatment.
   - Company verification: Prior Scientific's January xx.xx 2024 announcement explicitly identifies Queensgate as a Prior Scientific brand.
   - Company verification: Prior's January xx.xx 2024 announcement identifies Queensgate as a Prior Scientific brand.
4. Impressum | PriorScientific
   - Prior's legal notice identifies Prior Scientific Instruments Ltd. as the website provider and lists Queensgate, ProScan, and OptiScan among the registered trademarks described on the page.
5. Queensgate Instruments has been acquired by Prior Scientific Instruments Ltd
   - Company verification: Prior's May xx.xx 2018 announcement establishes its acquisition of Queensgate Instruments and the transfer of the associated personnel and manufacturing facility.
   - Company verification: The announcement presents Queensgate as a Prior Scientific brand.

23.9. Xeryon

Xeryon's portfolio distinguishes complete positioning stages from separately supplied ultrasonic piezo motors and actuators. Its stage categories include linear, rotary, vertical, XY, and multi-axis offerings, with XLS providing a named linear-stage purchasing route. ■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■ ■■■■■■ ■■■■■ ■■■■■■■■■■■ ■ ■■■■■■■■■ ■■■■■ ■■ ■■■■■■ ■■■■ ■■■■■■■■■■ ■ ■■■■■ ■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■ ■■■■ ■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■ ■■■ ■■■■■■■■■■ ■■■■ ■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■

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Sources & Evidence

1. Compact Piezo Stages & Actuators for Fast Precision Motion | Xeryon
   · Xeryon's portfolio separately advertises linear, rotary, vertical, XY, and multi-axis stages, as well as actuators, motors, controllers, software, and development kits. This supports the distinction between a stage purchase and an upstream motion-component purchase. ([xeryon.com](https://xeryon.com/products/))
   · Company verification: Xeryon's commercial portfolio includes micro linear stages, micro rotation stages, vertical stages, multi-axis stages, and XY scanning stages.
2. Linear Piezo Stages | Precise, Compact, Fast | Xeryon
   · The XLS page identifies a complete linear-stage family and named controller alternatives, with configuration-specific controller qualifications. Its broad compatibility descriptions do not establish identical electronics inclusion or compatibility for every variant. ([xeryon.com](https://xeryon.com/products/precision-linear-stages/xls-ultrasonic-linear-piezo-stage/))
3. Plug-and-Play Piezo Controllers | Single & Multi-axis Motion Control | Xeryon
   · Xeryon advertises XD-C, XD-M, and XD-OEM controller products. The integrated-controller listing is expressly labeled for XLA actuators, supporting a product-specific rather than portfolio-wide interpretation of embedded control. ([xeryon.com](https://xeryon.com/products/piezo-controllers/))
4. Development Kits for Piezo Stages & Actuators | Xeryon
   · The XLS development-kit description includes a stage, XD-C controller, power supply, and connection accessories. Xeryon states that online purchasing covers only certain base products and directs other models to a commercial inquiry. ([xeryon.com](https://xeryon.com/products/development-kits/))

23.10. Holmarc

[redacted] This gives institutional buyers and Equipment OEMs a manufacturer-engagement route rather than merely an Indian sales address for an unspecified imported product. However, a modular, ready-to-operate axis should not automatically be treated as a factory-integrated multi-axis system.

Holmarc also advertises continuing maintenance and modification support beyond the original warranty, subject to technical feasibility, and provides an after-sales service request route. [redacted] Item-specific origin documentation, supplied controls, installation scope, service charges, and delivery commitments should be settled before an institutional award or equipment purchase; the general manufacturing and support statements do not establish those order-specific conditions.

Sources & Evidence

1. Motorized Linear Stage
   · Holmarc states that it manufactures modular motorized translation stages and names MTS, LMS, and RCMTS families. It describes customer-side assembly of single-axis stages into multi-axis configurations and separately addresses custom requirements. ([holmarc.com](https://www.holmarc.com/motorized_ts.php))
   · Company verification: Holmarc states that it manufactures motorized linear translation stages and lists MTS, LMS, and RCMTS stage families.
2. Holmarc Opto-Mechatronics Ltd.
   · Holmarc identifies Holmarc Opto-Mechatronics Ltd. in Kochi, India, and describes its manufacturing business. It advertises maintenance and modification support beyond warranty or purchase year while qualifying continued use by technical feasibility. This is a stated service policy, not a transaction-specific service guarantee. ([holmarc.com](https://www.holmarc.com/company.php))
3. Our Service Team
   · Holmarc publishes an after-sales service request route. The accompanying terms state that onsite installation can be provided on the buyer's account and that delivery dates are estimates, supporting separate agreement of installation and delivery obligations. ([holmarc.com](https://www.holmarc.com/service_team.php))

23.11. ABTech

ABTech's HLS oil-hydrostatic linear stages provide a purchasing alternative in which supporting utilities are part of the commercial comparison. ■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■ ■■■■■■ ■■■ ■ ■■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■■■■■ ■ ■■■■ ■■■■ ■■■ ■■■■■■■■■■■■ Oil-hydrostatic guidance should therefore not be confused with evidence of hydraulic actuation: the advertised bearing arrangement and motor-drive package are separate characteristics.

For a machine-tool OEM or equipment integrator, the useful comparison is an agreed HLS system boundary rather than an isolated stage carriage. ■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■ ■■■■ ■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■ ■■■■ ■■ ■■■■■■ ■■■■■■■ ■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■ ■■ ■■■ ■■■■■■■■■ ■ ■■■■■■■■■■■■■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■■■■ Buyers should resolve those service obligations before treating HLS as commercially equivalent to another linear-stage package.

Sources & Evidence

1. Oil Hydrostatic Linear Stages - ABTech
   · ABTech advertises HLS oil-hydrostatic stages for standalone and multi-axis assemblies, hydrostatic pump units, and linear motors and encoders with application-specific controls. Its maintenance-free statements concern the bearing-motion proposition and do not establish maintenance obligations for every supporting subsystem.
   ([abtechmfg.com](https://www.abtechmfg.com/precision-motion-components/linear-stages/oil-hydrostatic-linear-stages))

2. Precision Linear Stages | ABTech Linear Bearings
   - ABTech's linear-stage portfolio includes oil-hydrostatic, mechanical, and air-bearing models. The hydrostatic portfolio description presents a complete system including a hydraulic pump unit and filtration, supporting a system-boundary comparison rather than a carriage-only comparison. ([abtechmfg.com](https://www.abtechmfg.com/precision-motion-components/linear-stages?hsLang=en))
   - Company verification: ABTech offers air-bearing, oil-hydrostatic, and mechanical linear stages, including custom positioning solutions.

23.12. New Scale Technologies

New Scale Technologies advertises M3-LS Linear Smart Stages with the controller and drive electronics embedded in the stage housing. ■■■■■■ ■■■ ■■ ■■■ ■■■■■■■■■■ ■■■■■■■■ ■ ■■■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■ ■■ ■■■■■■■■■■ ■■■■ ■ ■■■ ■■■■■■■■ ■■■■ ■■ ■ ■■■■■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■ ■■■■ ■ ■■■■■ ■■■■■■■■■■ ■ ■■■■■■■■ ■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ For an instrument OEM, the purchasing advantage is a defined stage-and-control module; the corresponding trade-off is that mechanical and control selection are coupled within that module rather than independently procured.

■■■■■■■■■ ■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■ ■■■ ■■■ ■■■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■■ ■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■ ■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■ ■ ■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■ ■■■■■■■■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■■■■ ■■■■■■ ■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■ ■■■ ■■■■■■ ■■ ■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■ An OEM choosing the integrated module should therefore settle host compatibility, production configuration, and any broader application-acceptance commitment before an equipment commitment. Embedded control removes a separate controller procurement task; it does not by itself transfer responsibility for the complete instrument.

Sources & Evidence

1. Linear Micro Stages - New Scale Technologies
   - M3-LS stages embed the controller and drive electronics, accept direct I2C or SPI communication, and use an adapter for USB connection. Developer kits include the stage, USB adapter, and software; direct and selected distributor ordering routes are advertised. ([newscaletech.com](https://newscaletech.com/micro-motion-modules/m3-ls-linear-smart-stages/))
   - Company verification: New Scale Technologies commercially advertises M3-LS Linear Smart Stages and named developer kits.
   - Company verification: The page identifies direct and distributor ordering routes, including U.S.-specific channels.
2. New Scale Technologies, Inc. - Terms and Conditions, Revision 05.06.2025
   - The sales terms identify New Scale Technologies, Inc., apply its written part-number specifications unless different specifications are agreed in writing, and exclude fitness-for-purpose warranties. These provisions support distinguishing module supply from a separately agreed finished-instrument acceptance obligation. ([newscaletech.com](https://newscaletech.com/wp-content/uploads/NewScale-Terms-Conditions_2025.pdf))

23.13. Del-Tron Precision, Inc.

[redacted]
The company describes single-axis, XY, and XYZ supply and manufacture at its Bethel, Connecticut factory. Its separate micrometer-positioning family is limited to micrometer heads, so buyers should not assume that every Del-Tron stage family carries the same actuation options.

[redacted] Del-Tron's terms distinguish special-order cancellation exposure and place application suitability with the user. Buyers should finalize the purchase specification and accepted cancellation conditions before authorizing a custom order, and should not infer a guaranteed later conversion from manual to motorized operation merely because both options appear in the portfolio.

Sources & Evidence

1. Precision Stages by Deltron Precision
   - Del-Tron describes VB, VR, and VS stages with manual and motorized actuation alternatives, single-axis, XY, and XYZ supply, and manufacture in Bethel, Connecticut. It distinguishes these configurable stages from its micrometer-only positioning-stage family. ([deltron.com](https://deltron.com/precision-stages.html))
   - Company verification: Del-Tron Precision, Inc. offers VB, VR, and VS positioning stages with manual or motorized actuation and single-axis, XY, or XYZ configurations.
   - Company verification: The company identifies manufacture at its Bethel, Connecticut factory.
2. High Precision Positioners and High Precision Positioning Stages
   - The High Precision Positioners page identifies ball and crossed-roller stage choices, micrometer heads, fine-adjustment screws, lead screws, motorized actuators, and customization. It supports actuation-choice analysis without establishing that a controller or later conversion is included. ([deltron.com](https://deltron.com/high_precision_positioners.html))
3. Del-Tron Precision Terms and Conditions
   - Del-Tron's terms allocate application suitability to the user and set distinct cancellation provisions for special orders. This supports confirming the purchase specification and cancellation exposure before authorizing customization. ([deltron.com](https://deltron.com/terms-conditions.html))

23.14. Edmund Optics

Edmund Optics combines own-brand stage cataloging with an identifiable import role, but these facts do not establish a common manufacturing origin. Its TECHSPEC center-drive, through-hole metric micrometer stage, stock xx.xx-xx.xx is identified as originating in Japan and imported by Edmund Optics India Private Limited. [redacted]

[redacted] Buyers can use Edmund's catalog route where the required model is covered, but the appointment does not establish access to Zaber's complete range. Where direct manufacturer supply is offered, that provides an alternative for requirements outside the selected catalog.

The procurement decision should preserve the distinction between brand owner, underlying manufacturer, importer, and seller of record. [redacted]

Sources & Evidence

1. Locations and Contact - Zaber
   · Zaber lists Edmund Optics as a nonexclusive, selected-product distributor for Canada, Macau, Mexico, and the United States. Zaber also describes direct full-range support as an alternative in some regions, rather than establishing that every distributor covers its complete portfolio. ([zaber.com](https://www.zaber.com/contact/))
2. 125mm, Center Drive, Thru-Hole, Metric Micrometer Stage
   · Edmund's TECHSPEC center-drive, through-hole metric micrometer stage, stock xx.xx-xx.xx is identified as a crossed-roller linear stage with Japan as its country of origin and Edmund Optics India Private Limited as importer. These facts are specific to that product record. ([edmundoptics.in](https://www.edmundoptics.in/p/125mm-center-drive-thru-hole-metric-micrometer-stage/xx.xx/?PrintPDF=true))
   · Company verification: Advertises an Edmund Optics TECHSPEC crossed-roller linear translation stage.
   · Company verification: Identifies Edmund Optics India Private Limited as importer and Japan as the product's country of origin.
3. TECHSPEC | Edmund Optics
   · Edmund defines TECHSPEC components as designed, specified, or manufactured by Edmund Optics. That brand definition does not establish that the company manufactures every branded stage or identify each product's underlying manufacturer. ([edmundoptics.in](https://www.edmundoptics.in/company/techspec/))
4. 70mm, English Rotary Stage | Edmund Optics
   · Company verification: Edmund Optics offers branded TECHSPEC rotary positioning stages through a specific commercial product page.
5. Edmund Optics Expands Motorized Stage Portfolio
   · Company verification: Edmund Optics describes an expanded TECHSPEC motorized-stage portfolio covering linear and rotary motion.

23.15. Kalatec Automação Ltda

Kalatec Automação Ltda advertises the MGL25 coordinate-table assembly with ball-screw and linear-guide construction, XY configuration possibilities, and alternative stepper, Easy Servo, and servo-motor choices. The product page identifies the Brazilian business and commercial offices, including Campinas, São Paulo, and Joinville. [redacted]

[illegible] Before choosing that route, the buyer should establish whether motors, drives, controls, XY assembly, installation, and repair responsibilities are included. Independently selecting those elements preserves sourcing choice but leaves their commercial interfaces with the buyer; local engagement is preferable only when the accepted quotation assigns the required responsibilities.

Sources & Evidence

1. MGL25 - Mesa de Coordenada com Guias 25mm | KALATEC
   - Kalatec advertises the MGL25 coordinate table with ball screws, linear guides, XY configuration possibilities, and alternative stepper, Easy Servo, and servo motors. The page identifies Kalatec Automação Ltda and Brazilian commercial offices, without establishing the origin or contents of an individual delivered package. ([kalatec.com.br](https://www.kalatec.com.br/mgl25-mesa-coordenada-guias-25mm/))
   - Company verification: Kalatec advertises the MGL25 complete coordinate-table assembly and describes XY configurations.
   - Company verification: The page identifies Kalatec Automação Ltda, provides its CNPJ, and lists Brazilian offices.
2. Sobre a Kalatec | Especialistas em Automação Industrial
   - Kalatec advertises application-engineering assistance and post-sale technical support for its automation products. These stated services support a local coordination proposition, but do not establish an MGL25-specific installation, repair, or response-time commitment. ([kalatec.com.br](https://www.kalatec.com.br/sobre-nos/))

23.16. SMC Corporation

SMC Corporation provides positioning-table choices that extend beyond electrically driven laboratory stages. Its MXQ air-slide-table offering establishes a named pneumatic table route. [illegible]

An industrial buyer with an accepted pneumatic equipment architecture can evaluate MXQ within that purchasing context. An Equipment OEM retaining its own motor and control choices can investigate the advertised motorless alternatives, while a buyer seeking a broader electric package should identify the supplied motor, controller, and accessories explicitly. [illegible]

[redacted]

Sources & Evidence

1. SMC - Air Slide Table MXQ Series
   · SMC advertises the MXQ Air Slide Table family within its air-cylinder offering and identifies named pneumatic table variants. This establishes a pneumatic positioning-table offering, not equivalence to an electric controlled axis.
   ([smcworld.com](https://www.smcworld.com/products/subject/en-ph/newgen_space/air_cylinder/mxq.html))
2. Buy LES/LE2S/LESH/LE2SH/LESYH online | SMC South Africa
   · SMC's South African catalog advertises LES, LE2S, LESH, LE2SH, and LESYH electric slide tables and describes stepper, servo, and motorless alternatives. The localized listing supports regional commercial inquiry, not universal availability or local manufacturing.
   ([smc.eu](https://www.smc.eu/en-za/products/les-le2s-lesh-le2sh-lesyh~xx.xx~nav))
   · Company verification: The SMC catalog advertises LES, LE2S, LESH, LE2SH, and LESYH electric slide-table families.
3. News | SMC CORPORATION
   · Company verification: SMC's official news record documents continuing operations and an October xx.xx 2025 commercial announcement covering LE2S(H) electric-actuator families.
   · Company verification: This supplements the captured named electric-slide-table catalogs without establishing stage-specific revenue.
4. Mesa lineal | SMC Argentina
   · Company verification: SMC's Argentine catalog advertises integrated precision linear slide-table families, including MXQ-Z and MXJ.
   · Company verification: The page identifies SMC Corporation in its copyright notice.
5. Mesa lineal | SMC Colombia
   · Company verification: SMC's Colombian catalog advertises named integrated linear slide tables, including MXQ-Z and MXJ.
   · Company verification: This establishes country-localized catalog advertising, not local manufacturing or realized sales.

23.17. igus SE & Co. KG

igus SE & Co. [redacted] For Equipment OEMs and Independent System Integrators, this provides an industrial XY-module option whose quoted configuration, rather than the wider igus component catalog, defines the purchase.

SHT-XY options include handwheels, position indicators and electric motorization. Buyers retaining operator-set adjustment can evaluate a manual configuration; automated positioning instead requires agreement on the motor, control electronics and integration scope. [redacted]

The November xx.xx 2025 legal-form announcement establishes business continuity from igus GmbH to igus SE & Co. ■■■ ■■ ■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■ ■■■■■■■ ■■■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■ ■■■■■■ ■■■■■ ■■■■■■ ■■■ ■■■■■■ ■■■■■ ■■ ■■■ ■■■■■■■■■■ A Turkish-language catalog establishes a localized offering; it does not establish Turkish manufacture, completed local transactions or equivalent installation and repair obligations across territories.

Sources & Evidence

1. Hassas ve korozyona dayanıklı XY tablaları
   - The Turkish catalog advertises drylin SHT and SLW XY positioning tables and describes manual and motorized formats. Its geographic presentation establishes an advertised offering, not local manufacture or completed sales. ([igus.com.tr](https://www.igus.com.tr/drive-technology/xy-table))
   - Company verification: The official Turkish catalog advertises drylin XY positioning tables in manual and motorized commercial formats.
   - Company verification: The page's legal footer identifies igus SE & Co. KG.
   - Company verification: The country catalog establishes an advertised Turkish-market offering, not Turkish manufacturing or completed sales.
   - Company verification: The catalog advertises drylin XY positioning tables under the protected row's supplier naming.
2. drylin® E | SLW-XY tablaları | igus®
   - igus describes SLW-XY as an installation-ready XY unit, offers configured travel arrangements, states that accessories are included, and provides quotation and inquiry routes. This establishes advertised mechanical-package scope, not complete-machine integration obligations. ([igus.com.tr](https://www.igus.com.tr/drive-technology/xy-table/slw-xy))
3. drylin SHT ve SHT-PL XY tablaları
   - The SHT-XY offering lists handwheels, position indicators, electric motorization options, a configurator and a quotation route. These options support configuration-specific purchasing analysis rather than an assumption that every table includes complete controls. ([igus.com.tr](https://www.igus.com.tr/drive-technology/xy-table/tbi-xy))
4. igus changes its legal form to SE & Co. KG and sets the course for further growth
   - The November xx.xx 2025 announcement states that igus GmbH now trades as igus SE & Co. KG and describes continuity of operational management following the legal-form change. ([press.igus.eu](https://press.igus.eu/igus-changes-its-legal-form-to-se-co-kg-and-sets-the-course-for-further-growth/))
   - Company verification: The November xx.xx 2025 announcement states that igus GmbH is now trading as igus SE & Co. KG following a change of legal form.
   - Company verification: The announcement describes continuing management and operating activities.

23.18. Zolix Instruments Co., Ltd.

■■■■■ ■■■■■■■■■■ ■■■■ ■■■■ ■■■■■■■■■ ■■■ ■■■ ■■■■ ■■■■■■■■ ■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■ ■■■■■■ ■■ ■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■ ■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■ ■■ ■■■■■■■■ ■■■■■■ ■■■ ■■■■■■■■■■ ■■■ ■■■■■■■■ ■■■■■■ ■■ ■■■■■■■■■ Equipment OEMs can therefore evaluate a stage purchase without assuming that a motorized listing includes a complete control system. The quotation should identify the supplied driver, controller and integration support.

The Beijing-headquartered business lists manual and motorized stages and describes customers in Chinese universities and industrial companies. This establishes a scientific and

industrial selling context, not named-customer adoption of CXP/CXPF, public-procurement eligibility or independent performance superiority. ■■■ ■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■ ■■■ ■■ ■■■■■■■■■■■ ■■ ■ ■■■■■■■■■■ ■■ ■■■■■■■■■ ■■■ ■■■■■■■ ■■■■■■■■ ■■■■■■■■

Zolix's published service policy offers a one-year warranty starting when the end user signs an acceptance report and excludes customer-caused damage. ■■■■■■■■■■■■■ ■■■■■■■ ■■ ■■■■ ■■■■■■■■ ■■■ ■■ ■■■ ■■ ■■■■■■■■■■■ ■■■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■ ■■ ■■■■■■■■■ ■■■■■■■ ■■■■■ ■■■ ■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■ ■■■■■■■ ■■■■■■■ ■■■■■■■■ ■■■ ■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■ ■■■■■■■ The undated policy supports contractual clarification, not an assumption of destination-specific repair coverage or an enforceable commitment for every stage order.

Sources & Evidence

1. CXP and CXPF series high-precise motorized linear stages - Zolix Instruments CO.,LTD
   - Zolix advertises CXP/CXPF motorized linear stages, attributes their design and manufacture to itself, identifies customer-equipment integration as a selling context, provides an inquiry route, and lists the stepping driver as optional. ([zolix.com.cn](https://www.zolix.com.cn/en/prodcon_371_384_418_779.html))
   - Company verification: Advertises CXP and CXPF motorized linear stages and states that Zolix designs and manufactures these offerings.
2. Corporate Profile - Zolix Instruments CO.,LTD
   - Zolix identifies Beijing as its headquarters, lists manual and motorized stages alongside scientific instruments, and describes Chinese university and industrial customers. The profile does not identify CXP/CXPF purchases by named customers. ([zolix.com.cn](https://www.zolix.com.cn/en/Content/xx.xx.html))
   - Company verification: Identifies Zolix Instruments Co., Ltd. and its Beijing headquarters.
   - Company verification: Lists motorized and manual stages among its products and expressly identifies customers in China.
3. Service Promises - Zolix Instruments CO.,LTD
   - Zolix publishes a one-year warranty beginning with an end-user-signed acceptance report, excludes customer-caused damage, and offers post-warranty service. The policy does not specify destination-specific repair arrangements. ([zolix.com.cn](https://www.zolix.com.cn/en/Service.html))

24. Companies Covered

Table 620. Global Motion Positioning Stages Market, Companies Covered

Company
Abiry Technologies
ABTech
Aerotech
Akribis Systems
Allient Inc.
Applied Engineering
Applied Scientific Instrumentation
Astro Optics Pvt. Ltd.
attocube
Avesta
Beijing 7 Star Optical Instruments Co., Ltd.
Beijing PDV Instrument Co., Ltd.
Bell-Everman, Inc.
Bosch Rexroth
Braddick Engineering
Cedrat Technologies
Chieftek Precision Co., Ltd.
Chuo Precision Industrial Co., Ltd.
CKD NIKKI DENSO CO., LTD.
COMS
CoreMorrow
Crescent Components and Systems
Daheng Optics
Del-Tron Precision, Inc.
Dgrande
Dover Motion
Doğuş Kalıp
DRP
Dynamic Structures and Materials, LLC
Edmund Optics

Table 620 - continued

Company
EKSMA Optics, UAB
Elcam
Electromate Inc.
Elliot Scientific
Equipment Solutions
ETEL
Ewellix
Feinmess Suhl GmbH
Festo
FUYU Technology Co., Ltd.
Föhrenbach GmbH
GHPC
Gilman Precision
GMT GLOBAL Inc.
Griffin Motion
Güdel
H2W Technologies
Helix Linear Technologies
Hikade Technologies
HIWIN
Holmarc
HUBER
Hyland Optical Technologies
IEF-Werner GmbH
igus
igus GmbH
igus SE & Co. KG
IKO Nippon Thompson
Instron
Instrument Design Technology Ltd.
IntelLiDrives, Inc.
IRELEC

Table 620 - continued

Company
isel
JAEWON Co., Ltd.
JAT - Jenaer Antriebstechnik GmbH
Jenny Science AG
Jiangsu Wantai Motor Co., Ltd.
JJ X-Ray
JPE
JUSTEK
Kalatec Automação Ltda
Kensington Laboratories
Keysight Technologies
Kohzu Precision Co., Ltd.
KSS
Kugler GmbH
LAB Motion Systems
Labjacks.com Inc.
LG Motion Ltd.
Lintech
Lishui Yongrun Precision Machinery Co., Ltd.
Ludl Electronic Products Ltd.
Luminos
Mad City Labs, Inc.
Manrod
mechOnics ag
MI-Partners B.V.
MICRONIX USA
MiniTec
Motion Solutions
MPositioning Co., Limited
MultiFields Technology
Myostat Motion Control
Märzhäuser Wetzlar

Table 620 - continued

Company
nanoFaktur GmbH
Nanomotion
National Aperture, Inc.
New Scale Technologies
Newmark Systems
Newport
NIKKEN
Nippon Bearing Co., Ltd.
Nippon Pulse
Nippon Pulse Motor Co., Ltd.
norelem
NSK
NUTEC Components Inc
OAV Air Bearings
Omo Grassi
Optimal Engineering Systems, Inc.
Opto Electronics Private Limited
Oriental Motor
OWIS
Parker Hannifin
PBA Systems
PBC Linear
Physik Instrumente (PI) SE & Co. KG
Picard Industries
PIEZOCONCEPT
piezosystem jena
PM B.V.
Poletti Macchine Utensili SRL
Posibras
Positech Ltd.
Primatics
Prior Scientific Instruments Ltd.

Table 620 - continued

Company
Proxxon
Queensgate
RBC Bearings
Reliant Systems, Inc.
RK Rose+Krieger
Rockwell Automation
ROLLICO
Sanying MotionControl Instruments Ltd
SCHNEEBERGER
Schneider Electric
Scientifica
Sensapex
Shenzhen Luckym Technology Co., Ltd.
SIGMAKOKI
SINADRIVES
Siskiyou Corporation
SmarAct
SMC
SMC Corporation
Standa
Steinmeyer Mechatronik GmbH
Suruga Seiki Co., Ltd.
Sutter Instrument
Symetrie
Tallman Robotics
TBI MOTION TECHNOLOGY CO., LTD.
TECSCI
THK
Thomson Industries, Inc.
Thorlabs
Unistamp
Velmex, Inc.

Table 620 - continued

Company
VERTEX
Winner Optics
Xeryon
Yaskawa Europe Technology Ltd.
Zaber
Zolix Instruments Co., Ltd.
□□□□ □□□□□□□□
吉林光驰科技有限公司
浙江零振智能装备有限公司
코아시스템즈

Sources & Evidence

1. Aerotech Modern Slavery Statement FY2026
   - Company verification: The FY2026 statement identifies Aerotech Inc. as the manufacturer of positioning tables, stages, and positioning systems.
   - Company verification: It distinguishes Aerotech Inc.'s manufacturing role from Aerotech Ltd.'s UK marketing and sales role.
2. About Us | Your Motion Control Partner
   - Company verification: Aerotech describes an operating, privately held precision-motion business with international facilities and representation.
   - Company verification: Its company history documents positioning-stage and engineered-motion-system activities.
3. HOERBIGER Completes Acquisition of PI: Dr. Michael Albiez Appointed New CEO
   - Company verification: HOERBIGER completed its acquisition of Physik Instrumente on March xx.xx 2026, after regulatory approvals.
   - Company verification: PI retains its name, brand, and independent operating identity within HOERBIGER.
   - Company verification: The announcement identifies Physik Instrumente (PI) SE & Co. KG and its continuing international positioning business.
4. On-shore custom design & service ITAR Registered | Motion Control | PI
   - Company verification: PI's U.S. business page identifies PI (Physik Instrumente) LP as a PI Group subsidiary.
   - Company verification: It documents the November 2025 move to a new manufacturing and engineering center and continuing air-bearing, mechanical-stage, and nanopositioning activities.
5. About - Zaber
   - Company verification: Zaber identifies its operating business as Zaber Technologies Inc.
   - Company verification: It designs and manufactures precision-positioning devices and describes worldwide distribution and an integrated-product business model.
6. About Us - Dover Motion
   - Company verification: Dover Motion identifies itself as part of the Ralliant portfolio.
   - Company verification: Its current business page offers configurable linear and rotary stages and custom motion solutions for external customers.
   - Company verification: It describes an installed-product base across industrial and scientific applications.

7. LGS Stages - High performance linear positioning stages
   - Company verification: The 2025 Novanta-branded brochure advertises LGS linear positioning stages through Motion Solutions.
   - Company verification: It identifies commercial locations in California and Wisconsin and provides a Motion Solutions sales route.
8. Imprint Motion - SmarAct
   - Company verification: SmarAct's motion-business legal notice identifies SmarAct GmbH, its Oldenburg business address, and commercial-register entry HRB xx.xx.
9. Steinmeyer Gruppe
   - Company verification: Steinmeyer Group identifies Steinmeyer Holding GmbH and Steinmeyer Mechatronik GmbH at its Dresden production location.
   - Company verification: The same group record identifies Feinmess Suhl GmbH at its Suhl location.
   - Company verification: Feinmess Suhl and Steinmeyer Mechatronik therefore have a documented common-group relationship; this record does not establish Feinmess Suhl's own current complete-stage offering.
10. Faster to market
    - Company verification: HIWIN's company-authored business paper identifies HIWIN Corporation in Illinois, its Taiwanese parent HIWIN Technologies, and sister company HIWIN Mikrosystem.
    - Company verification: It describes HIWIN Corporation's standard and custom single-axis and multi-axis stage supply to OEM and automation-integration customers.
11. Company - ETEL SA
    - Company verification: ETEL identifies ETEL S.A. as part of the HEIDENHAIN Corporate Group.
    - Company verification: Its company record describes continuing precision-motion-system operations and distribution through the HEIDENHAIN sales network.
12. attocube company structure - pioneering partners in innovation
    - Company verification: The company-structure page identifies attocube systems GmbH in Haar, Germany.
    - Company verification: It establishes attocube's membership in the WITTENSTEIN group and its nanotechnology business role.
13. Impressum - Piezosystem
    - Company verification: The legal notice identifies piezosystem jena GmbH, its Jena address, and commercial-register entry HRB xx.xx.
    - Company verification: It separately identifies the company's U.S. commercial presentation, supporting an operating-company rather than an assumed independent regional-office reporting level.
14. Queensgate Instruments has been acquired by Prior Scientific Instruments Ltd
    - Company verification: Prior's May xx.xx 2018 announcement establishes its acquisition of Queensgate Instruments and the transfer of the associated personnel and manufacturing facility.
    - Company verification: The announcement presents Queensgate as a Prior Scientific brand.
    - Company verification: Queensgate is identified as an acquired Prior Scientific brand, not an independent economic competitor.
15. igus changes its legal form to SE & Co. KG and sets the course for further growth
    - Company verification: The November xx.xx 2025 announcement states that igus GmbH is now trading as igus SE & Co. KG following a change of legal form.
    - Company verification: The announcement describes continuing management and operating activities.
    - Company verification: The generic igus representation overlaps the supplier whose current legal form is igus SE & Co. KG.
    - Company verification: The protected igus GmbH title reflects the supplier's former legal form rather than another independent competitor.

16. Newport Corporation - Form 10-K for the year ended January 2, 2010
    - Company verification: Newport's mandatory filing states that it sold its robotic-systems operations to Kensington Laboratories LLC in 2005.
    - Company verification: Historical Newport ownership therefore cannot establish present consolidation of the separately retained Kensington business.
    - Company verification: The filing documents Kensington Laboratories LLC as the purchaser of Newport's robotic-systems operations in 2005.
    - Company verification: It does not establish Kensington's current ownership.
17. SCR100-300 Nanopositioning Linear Stages - Nippon Pulse America, Inc.
    - Company verification: Nippon Pulse America's current commercial page advertises SCR100-xx.xx nanopositioning linear stages with a quotation route.
    - Company verification: The page closes the inherited absence of a currently inspectable named SCR offering.
    - Company verification: The same SCR offering is marketed under Nippon Pulse, supporting an overlapping brand representation rather than an additional manufacturer.
18. News | SMC CORPORATION
    - Company verification: SMC's official news record documents continuing operations and an October xx.xx 2025 commercial announcement covering LE2S(H) electric-actuator families.
    - Company verification: This supplements the captured named electric-slide-table catalogs without establishing stage-specific revenue.
    - Company verification: The SMC-branded corporate and product presentation corresponds to the retained SMC Corporation supplier representation, not evidence of another manufacturer.
19. Positioning systems with exact & play-free guides | norelem USA
    - Company verification: norelem's inspected U.S. catalog advertises named xx.xx xx.xx xx.xx xx.xx and xx.xx positioning-stage families with commercial ordering routes.
    - Company verification: The page identifies NK North America Inc. as the U.S. business contact, but does not establish the complete global ownership perimeter.
20. Add-on motorized xy-stage for upright microscope - Sensapex Shop
    - Company verification: Sensapex's inspected store offers an add-on motorized XY-stage package incorporating the uMs-MXY translator.
    - Company verification: The page provides a quotation route, establishing a separately advertised stage offering rather than only a complete microscope.
21. Sensapex - Acuvi | Innovation in Motion
    - Company verification: Acuvi currently presents Sensapex within its business portfolio and describes its precision-positioning and microscopy-platform activities.
    - Company verification: The page does not establish the complete legal shareholding chain.
22. About Kensington Laboratories & Automation
    - Company verification: Kensington's inspected business page identifies continuing U.S. manufacturing and semiconductor-automation activities.
    - Company verification: It does not identify the company's current equity owner or establish its complete legal reporting perimeter.

23. THK CHUO | THK
    - Company verification: THK markets a precision-stage range using THK CHUO branding.
    - Company verification: The page does not establish the ownership, licensing, or manufacturing agreement underlying that shared presentation.
    - Company verification: THK's inspected THK CHUO presentation advertises manual and Fix Stage families, including linear, XY, vertical, rotary, and tilt products.
    - Company verification: The presentation identifies THK GmbH European Headquarters as a commercial contact; it does not state the equity or contractual basis of the THK/Chuo relationship.
    - Company verification: THK's THK CHUO stage presentation makes the commercial relationship with the retained Chuo identity material to attribution.
    - Company verification: Shared branding alone does not establish an equity relationship or independent stage-sales contributions.
    - Company verification: THK continues to present stage products using THK CHUO branding.
    - Company verification: The shared-brand presentation does not establish Chuo's ownership, licensing terms, manufacturing allocation, or independently attributable sales.
24. Stage & Actuator Products | Aerotech
    - Company verification: Aerotech advertises linear and rotary positioning stages across single-axis and multi-axis configurations, including mechanical-bearing, air-bearing, and flexure-bearing offerings.
25. Precision Motion Control Technologies | Positioning Systems
    - Company verification: PI's commercial portfolio includes linear and rotary positioning stages, piezo nanopositioning systems, air-bearing systems, and hexapod positioners.
26. About | PI (Physik Instrumente)
    - Company verification: The official company page identifies Physik Instrumente (PI) SE & Co. KG and its Karlsruhe, Germany address.
27. M-IMS500CC Motorized Linear Stage
    - Company verification: Newport directly advertises the M-IMS500CC motorized linear stage for industrial and laboratory positioning applications.
28. Newport
    - Company verification: MKS identifies Newport as a brand within its Photonics Solutions division and includes precision motion control in the Newport portfolio.
29. Motorized Stages - Thorlabs
    - Company verification: Thorlabs advertises motorized linear stages, rotation stages, multi-axis platforms, goniometers, vertical stages, and microscopy stages.
30. Parker Electronic Controls & Motion Division Industrial Products Systems
    - Company verification: Parker's official industrial-products portfolio includes precision positioning tables, linear-motor stages, and focusing nanopositioners.
31. LRT Family - Linear Stages - Zaber
    - Company verification: Zaber advertises the LRT family of screw-driven linear stages, including built-in-controller and motor-only models.
    - Company verification: The product page describes direct North American pricing and distributor arrangements for other territories.
32. SmartStage Ecosystem - Dover Motion
    - Company verification: Dover Motion advertises its SmartStage ecosystem of linear-motor stages, including SmartStage XY positioning stages with integrated control.
33. Stages - Allient, Inc.
    - Company verification: Allient advertises ALIO-branded linear, rotary, XY, XYZ, air-bearing, and hybrid-hexapod positioning offerings.
34. Who We Are | Allient Inc.
    - Company verification: Allient identifies Allient Denver as formerly ALIO Industries and describes an ongoing transition from individual business brands to Allient location-based names.

35. Linear Stages : Linear Slide Positioners : Newmark Systems Inc
    - Company verification: Newmark Systems advertises named linear-stage families, including NB8, LMS, Microslide, and NLS offerings, with multi-axis configurations.
    - Company verification: The company identifies industrial automation, photonics, inspection, semiconductor equipment, and related applications.
36. Rotary Positioning Actuators, Stages and Tables | Lintech
    - Company verification: Lintech advertises rotary positioning tables intended for precision positioning with servo or stepper-motor systems.
37. Linear Stage - Linear Motion Systems - H2W Technologies
    - Company verification: H2W Technologies advertises linear positioning stages, including voice-coil positioning-stage offerings.
38. nPoint, Inc. Joins the Motion Solutions Family - Motion Solutions
    - Company verification: Motion Solutions announced on January xx.xx 2020 that nPoint had joined its business.
    - Company verification: The announcement identifies nPoint's flexure-based piezo stages and OEM positioning business.
39. Compact Stages
    - Company verification: The nPS35 compact-stage brochure identifies Motion Solutions and nPoint and presents commercial stage configurations.
40. Novanta completes acquisition of Motion Solutions
    - Company verification: Novanta's SEC-filed announcement states that it completed the acquisition of Motion Solutions on January xx.xx 2024.
    - Company verification: The acquired business is described as supplying customized precision-motion subsystems and components to OEMs.
41. Motion Products & Nano-Positioning Systems - SmarAct
    - Company verification: SmarAct advertises linear, rotation, high-load, and goniometer stages, positioning systems, and specialized-environment stage offerings.
42. SEMICON Taiwan 2026
    - Company verification: SEMI's SEMICON Taiwan 2026 exhibitor record identifies SmarAct and describes its commercially promoted positioning offerings.
43. Positioners by OWIS - OWIS
    - Company verification: OWIS advertises manual and motorized positioners, including linear, XY, elevator, rotation, swivel, and tilt-stage categories.
44. Opto-Mechanical Products - Standa
    - Company verification: Standa's product portfolio lists motorized positioning products, including the 8MTL120XY planar XY stage and 8MTL165-xx.xx linear stage.
    - Company verification: The page identifies Standa in Lithuania.
45. Optosigma - About Us
    - Company verification: OptoSigma's official company account identifies SIGMAKOKI and describes the group's stages, optomechanical products, and automation products.
    - Company verification: The page describes OptoSigma's expansion from SIGMAKOKI and production operations in Japan and China.
46. Positioning stages - Kohzu Precision Co., Ltd.
    - Company verification: Kohzu Precision advertises manual and motorized X/XY, Z, rotation, and swivel positioning stages.
    - Company verification: The portfolio page identifies offices in Japan and Shanghai.
47. Motorized Stage | SURUGA SEIKI CO., LTD.
    - Company verification: Suruga Seiki advertises motorized linear, goniometer, and rotary stages and corresponding motorless stage categories.

48. Corporate Profile -CHUO PRECISION INDUSTRIAL CO.,LTD.-
    - Company verification: Chuo's official corporate profile identifies Chuo Precision Industrial Co., Ltd. and lists automatic and manual mechanical stages among its main products.
49. X Stages -CHUO PRECISION INDUSTRIAL CO.,LTD.-
    - Company verification: Chuo's commercial X-stage catalog lists named manual positioning-stage products, including SRS-xx.xx RX-X, and RM-X.
50. Unit Solutions | Linear Actuator | Product Information | THK Official Web Site [North America]
    - Company verification: THK advertises AX precision stages, CMX alignment stages, DX large-aperture stages, and EX high-throughput stages.
51. Precision Positioning Table TU | Mechatronics Series | IKO NIPPON THOMPSON
    - Company verification: IKO Nippon Thompson advertises the TU precision-positioning-table series as a configurable commercial offering.
52. Single Axis Stages | HIWIN
    - Company verification: HIWIN's official commercial site advertises single-axis stage families, including NPS precision stages.
    - Company verification: The page establishes a HIWIN-branded stage offering but does not by itself resolve the consolidated legal reporting entity.
53. XY Tables | NSK Global
    - Company verification: NSK advertises precision positioning tables and XY modules for electronics, semiconductor equipment, and medical-analysis-device applications.
54. Motion systems Archives - ETEL SA
    - Company verification: ETEL advertises linear and rotary axes, combined modules, stacked positioning systems, and planar platforms.
    - Company verification: Named offerings include CHARON2 and METIS stage platforms for external equipment builders.
55. Precision Positioning & Motion Systems USA | SCHNEEBERGER
    - Company verification: SCHNEEBERGER advertises engineered-to-order precision positioning and motion systems.
    - Company verification: The company identifies development and production sites in Switzerland, the United States, and China and names semiconductor and other equipment markets.
56. Miniature Stages
    - Company verification: Akribis Systems advertises miniature direct-drive positioning stages as integrated commercial positioning systems.
57. Nanopositioners - nanopositioning made simple
    - Company verification: attocube advertises linear, rotary, and goniometric nanopositioners, scanners, and integrated multi-axis positioning solutions.
58. Nanopositioning Stages, Nanopositioners, Piezo Stages, Micropositioning Systems, AFM, Metrology, Fluorescence Imaging, Piezoactuators, and Custom and OEM Solutions | Mad City Labs
    - Company verification: Mad City Labs, Inc. advertises piezo nanopositioning systems and manual and automated micropositioning stages, including custom/OEM options.
59. One Axis - Piezosystem
    - Company verification: piezosystem jena advertises one-axis piezo positioning stages for semiconductor, photonics, and other instrument applications.
60. Motorized XY Microscope Stages | High-Precision Positioning
    - Company verification: Prior Scientific advertises named ProScan and OptiScan motorized XY microscope-stage products.
    - Company verification: The page identifies Prior Scientific Instruments Ltd. and commercial locations in the United Kingdom, United States, Germany, Japan, and China.

61. 3D/4D Stage - ASI
    - Company verification: Applied Scientific Instrumentation advertises a 3D/4D stage assembly comprising linear positioning stages and an optional rotary axis.
62. Motorized Z-Axes - Märzhäuser Wetzlar
    - Company verification: Märzhäuser Wetzlar advertises motorized Z-axis positioning products for automated microscopy.
63. Compact Piezo Stages & Actuators for Fast Precision Motion | Xeryon
    - Company verification: Xeryon's commercial portfolio includes micro linear stages, micro rotation stages, vertical stages, multi-axis stages, and XY scanning stages.
64. Motorized Linear Stage
    - Company verification: Holmarc states that it manufactures motorized linear translation stages and lists MTS, LMS, and RCMTS stage families.
65. Motorized XY Stages & XY Translation Tables | OES
    - Company verification: OES publicly offers motorized XY stages and XY translation tables through its commercial portfolio.
66. About OES, The Motion Control Company
    - Company verification: OES publishes an official company business page under its motion-control commercial identity.
67. Intellidrives XYZR LSMA-100x100+MLVT70-13+RTHM151
    - Company verification: IntelLiDrives advertises the XYZR LSMA-100x100+MLVT70-xx.xx+RTHM151 multi-axis positioning assembly.
68. Address, Phone. Skype
    - Company verification: IntelLiDrives publishes an official commercial address and contact page associated with its positioning-product business.
69. Precision Linear Stages | ABTech Linear Bearings
    - Company verification: ABTech offers air-bearing, oil-hydrostatic, and mechanical linear stages, including custom positioning solutions.
70. Bell-Everman - LowBoy Stages in Semilab Systems
    - Company verification: Bell-Everman's case document identifies it as the designer and manufacturer of LowBoy linear stages.
    - Company verification: The manufacturer-published case describes use of LowBoy stages in Semilab equipment and provides a California business address.
71. Linear Micro Stages - New Scale Technologies
    - Company verification: New Scale Technologies commercially advertises M3-LS Linear Smart Stages and named developer kits.
    - Company verification: The page identifies direct and distributor ordering routes, including U.S.-specific channels.
72. Precision Stages by Deltron Precision
    - Company verification: Del-Tron Precision, Inc. offers VB, VR, and VS positioning stages with manual or motorized actuation and single-axis, XY, or XYZ configurations.
    - Company verification: The company identifies manufacture at its Bethel, Connecticut factory.
73. Company | Dynamic Structures & Materials, LLC
    - Company verification: Dynamic Structures and Materials, LLC identifies custom precision-motion and stage-design services as company business activities.
    - Company verification: Its company material describes delivery of a custom wide-aperture microscope stage.
74. Positioners | MICRONIX
    - Company verification: MICRONIX maintains a commercial positioner catalog for its stage business.
75. About MICRONIX | MICRONIX
    - Company verification: MICRONIX publishes an official company identity page associated with its positioning-product catalog.

76. 70mm, English Rotary Stage | Edmund Optics
    - Company verification: Edmund Optics offers branded TECHSPEC rotary positioning stages through a specific commercial product page.
77. Edmund Optics Expands Motorized Stage Portfolio
    - Company verification: Edmund Optics describes an expanded TECHSPEC motorized-stage portfolio covering linear and rotary motion.
78. MM-3M-ST Linear | NAI
    - Company verification: National Aperture offers the MM-3M-ST motorized MicroMini linear stage through a configurable commercial product page.
79. About Us | Primatics
    - Company verification: Primatics identifies positioning stages as commercial products in its official company material.
80. Catalog - Ascential Medical & Life Sciences
    - Company verification: Ascential Medical & Life Sciences hosts a commercial catalog with a Primatics brand filter, establishing a current market-facing catalog association.
81. Stages & Translators for Micromanipulation, Patch Clamp
    - Company verification: Sutter Instrument advertises 3DMS motorized stages, microscope translation systems, and MPC-xx.xx/MP-xx.xx moving-stage platforms.
82. Sutter Instrument - Motorized Microscope Stages and Translators
    - Company verification: Sutter's October 2019 stage comparison document identifies named motorized-stage offerings and a Novato, California business address.
    - Company verification: The document's historical address and made-in-USA statement are not treated as proof of current manufacturing location.
83. USB XYZ Stage - Picard Industries
    - Company verification: Picard Industries advertises a complete USB XYZ positioning-stage system on its official product page.
84. VCS-10 Voice Coil Linear Stage
    - Company verification: Equipment Solutions offers the VCS-xx.xx/VCS-xx.xx voice-coil linear stage as a guided positioning assembly.
85. Positioners | Luminos
    - Company verification: Luminos advertises named CORALIGN linear, rotational, and multi-axis positioners.
    - Company verification: Its portfolio describes manual, automated, and semi-automated commercial configurations.
86. Linear Stages | Myostat Motion Control
    - Company verification: Myostat Motion Control lists PA, SPA, and RL positioning assemblies in a commercial linear-stage catalog.
    - Company verification: The page describes guided ballscrew assemblies with integrated motor mounts; it does not independently resolve manufacturing origin.
87. Contact | Myostat Motion Control
    - Company verification: Myostat Motion Control publishes an official business contact page associated with its commercial catalog.
88. 100.5cr Series Stage - Siskiyou Corporation
    - Company verification: Siskiyou Corporation offers the xx.xx.5cr Series Stage through a priced commercial product page.
89. Custom Solutions | Reliant Systems, Inc.
    - Company verification: Reliant Systems offers custom OEM motion assemblies built around linear, XY, rotary, Z-axis, and air-bearing stages.
    - Company verification: The company advertises externally supplied custom multi-axis positioning assemblies.

90. Gilman Precision - Slides Catalog
    - Company verification: Gilman Precision's official slides catalog documents complete positioning-slide assemblies, including two-axis configurations and manual positioning offerings.
91. Integrated Precision Stages for Automation | X-Y-Z-□ Stages
    - Company verification: Kensington advertises integrated XYZ-theta and rotary stages and invites commercial quotations.
    - Company verification: The offering addresses externally supplied wafer, sample, and photonic-device positioning systems.
92. Wafer Automation, Robots & Precision Products
    - Company verification: Kensington Laboratories identifies precision stages among its commercial product families.
93. Compact Linear Actuators - PBC Linear
    - Company verification: PBC Linear offers compact guided lead-screw assemblies with motor, manual-knob, or customer-drive options.
    - Company verification: The company markets these assemblies for positioning-stage applications; market membership remains subject to the complete-stage working boundary.
94. Custom Positioning Stages | Electromate Canada
    - Company verification: Electromate advertises custom linear, rotary, and XY positioning-stage solutions and engineering support.
    - Company verification: The same page promotes Lintech custom stages and identifies Electromate Inc. as Canadian owned and operated; it does not establish an independent manufacturing role.
95. UniSlide® Linear Positioning Stages
    - Company verification: Velmex offers named motorized UniSlide linear and XY positioning assemblies.
    - Company verification: The product page identifies Velmex, Inc. and its Bloomfield, New York business address.
96. Linear Stages | Griffin Motion, LLC
    - Company verification: Griffin Motion's official catalog lists named LM2-BS, LM3-BS, LM3-LM, LM7, LM9, LNS, MCS, and NPS linear-stage offerings.
97. NEWPORT CORPORATION - SATELSA S.A. de C.V.
    - Company verification: Satelsa presents Newport in its Spanish-language brand portfolio, providing a Mexican channel reference.
    - Company verification: The page does not establish a stage-specific sale or an authorized-distributor appointment.
98. MGL25 - Mesa de Coordenada com Guias 25mm | KALATEC
    - Company verification: Kalatec advertises the MGL25 complete coordinate-table assembly and describes XY configurations.
    - Company verification: The page identifies Kalatec Automação Ltda, provides its CNPJ, and lists Brazilian offices.
99. www.tecsci.com.ar - product catalog
    - Company verification: TECSCI's catalog identifies an Argentine scientific-equipment business associated with a university spin-off.
    - Company verification: The catalog offers LSXXX linear tables with controllers and XY combinations and provides a Buenos Aires address.
100. Mesa indexadora rotativa M140 | Posibras
    - Company verification: Posibras advertises the M140 rotary indexing table for integration into assembly, inspection, and other industrial equipment.

101. Nossa história | Posibras
    - Company verification: Posibras describes itself as a Brazilian indexing-table manufacturer and identifies founders Angelo and Eduardo Marzolla.
    - Company verification: The company states that it exports to markets in North, Central, and South America; individual destination countries are not established.
102. Mesas en cruz precisas y sin corrosión | igus Argentina
    - Company verification: The official igus Argentine catalog offers drylin SHT and SLW cross tables as complete manual or motorized positioning modules.
    - Company verification: The page provides an Argentine distributor contact, establishing an advertised regional route to market rather than completed sales.
103. Mesas de Translação e Fixação | Instron
    - Company verification: Instron's Brazilian Portuguese catalog advertises the xx.xx-xx.xx manual Theta-X-Y translation stage for microelectronics-related positioning.
    - Company verification: The source establishes a localized catalog offering, not a Brazilian manufacturing site or completed local sale.
104. Mesa lineal | SMC Argentina
    - Company verification: SMC's Argentine catalog advertises integrated precision linear slide-table families, including MXQ-Z and MXJ.
    - Company verification: The page identifies SMC Corporation in its copyright notice.
105. Mesa lineal | SMC Colombia
    - Company verification: SMC's Colombian catalog advertises named integrated linear slide tables, including MXQ-Z and MXJ.
    - Company verification: This establishes country-localized catalog advertising, not local manufacturing or realized sales.
106. Mesa Posicionadora - Dgrande
    - Company verification: Dgrande advertises customized positioning tables for industrial assembly and welding, including lift, rotation, and tilt offerings.
    - Company verification: The product page lists a São José dos Pinhais, Paraná contact.
107. UNISTAMP® - Sistema Modular
    - Company verification: Unistamp's company-hosted catalog advertises its XY coordinate table as a purchasable accessory alongside sheet-metal tooling modules.
    - Company verification: The inspected catalog does not establish current product availability or the legal supplier's identity.
108. Lexium TAS | Schneider Electric Argentina
    - Company verification: The retrieved Schneider Electric site identifies its Argentina, Uruguay, and Paraguay regional context.
    - Company verification: The attempted Lexium TAS range page did not expose usable product content, so this source supports regional website identity only.
109. Symétrie - Company Profile
    - Company verification: The company profile identifies Symetrie in France and describes standard and custom hexapod products for precision positioning.
    - Company verification: The profile distinguishes positioning products from motion products and identifies external industrial and scientific customer markets.
110. PM - Product Overview
    - Company verification: PM identifies itself as an independent family-run Dutch business supplying positioning stages and engineered motion systems.
    - Company verification: The document identifies PM B.V. and its Dedemsvaart, Netherlands business address.

111. MI-Partners B.V. | European Monitor of Industrial Ecosystems
    - Company verification: The European Commission business entry identifies MI-Partners B.V. in Veldhoven, Netherlands.
    - Company verification: It describes an SME providing custom mechatronic development, prototypes, and one-of-a-kind equipment to OEM and scientific customers.
112. Projects | MI Partners
    - Company verification: MI-Partners lists a sample positioning stage and a nano precision stage among its completed custom projects.
    - Company verification: The page frames these projects as prototypes and one-of-a-kind equipment developed for customers.
    - Company verification: MI-Partners states that a wafer-alignment precision stage was developed and built in close cooperation with Bosch Rexroth.
    - Company verification: This supports a development collaboration, not a current Bosch Rexroth catalog-stage offering.
113. LG Series from LG Motion - Motion Control Specialists in the UK
    - Company verification: LG Motion advertises the LG series of positioning tables for multi-axis systems.
    - Company verification: The page states that these products are manufactured in its own factory and supplied to scientific and industrial applications.
114. Cryo & UHV Products Overview - JPE
    - Company verification: JPE's product portfolio advertises Cryo Stage xx.xx Cryo Positioning Stage, cryogenic tip-tilt stages, and Vacuum Linear Stages.
    - Company verification: These are named complete positioning offerings rather than only actuators or controllers.
115. Scientifica Universal Motorised Stage (UMS) | Scientifica
    - Company verification: Scientifica publicly offers the Universal Motorised Stage as an XY translation-stage product and invites quotation requests.
    - Company verification: The product page identifies Scientifica as a Judges Scientific plc company.
116. Single Axis Tilt Stage 850-0040 | Eksma Optics
    - Company verification: The official catalog lists Single Axis Tilt Stage xx.xx-xx.xx and variant xx.xx-xx.xx.
    - Company verification: The page identifies Eksma Optics, UAB and its Lithuanian company registration details.
    - Company verification: The retrieved order table marked the listed variants out of stock.
117. High-Precision and Compact Motion Components for Automation | Jenny Science AG
    - Company verification: Jenny Science AG advertises INTAX integrated linear-motor stages, LINAX axes, ELAX linear-motor slides, and ROTAX rotary stages.
118. Jenny Science AG: Company History & Milestones in Automation
    - Company verification: Jenny Science's company history describes the business as family-run and identifies its headquarters in Rain, Switzerland.
119. SMR - Stoły mikrometryczne - Produkty - Rollico
    - Company verification: ROLliCO's Polish product page advertises SMR micrometer positioning tables for controlled movement in one or more axes.
    - Company verification: The page identifies the ROLLICO Rolling Components business in Lubliniec, Poland.
120. Standorte | Föhrenbach
    - Company verification: The official locations page identifies Föhrenbach GmbH in Löffingen-Unadingen, Germany, with rotary-table and complete-system activities.
    - Company verification: It also identifies related operations in Switzerland and Ireland.
121. SINADRIVES Direct Drive and linear motor stage experts
    - Company verification: SINADRIVES describes manufacture and assembly of linear-motor stages and complete guided axis systems.
    - Company verification: The company page names SINADRIVES GmbH in Germany and SINADRIVES S.L. in Girona, Spain.

122. Standardversteller domiLINE, Breite 30 mm | IEF-Werner
    - Company verification: IEF-Werner publicly catalogs the domiLINE xx.xx manual positioning assembly with orderable article numbers and a sales-contact route.
    - Company verification: The page identifies IEF-Werner GmbH.
123. High-precision Positioning Products - Rotary Stages, XY & Gantry Stages
    - Company verification: LAB Motion Systems advertises rotary, linear, Z, XY, gantry, and planar stages.
    - Company verification: Its product page provides a Bekkevoort, Belgium business address and describes OEM and custom-solution routes.
124. drylin® stolik krzyżowy SHT/SHT-PL | igus Polska
    - Company verification: igus's Polish commercial portfolio lists drylin SHT-XY cross tables as complete positioning assemblies.
    - Company verification: The page discusses motorized configurations alongside the guided cross-table offering.
125. Engineering - Feinmess Suhl GmbH
    - Company verification: Feinmess Suhl's engineering page describes engineering, precision manufacturing, and assembly capabilities for positioning systems and positioning tables.
    - Company verification: The page does not by itself establish a current named catalog-stage product.
126. Attuatori Lineari per l'automazione - Elcam Spa Milano - Italy
    - Company verification: Elcam's Italian commercial page advertises linear systems and precision XYZ tables under its own offering.
    - Company verification: The page does not resolve whether the complete tables are proprietary products or third-party distribution.
127. TAVOLE ROTANTI TMT Poletti Macchine Utensili SRL
    - Company verification: Poletti's TMT product page advertises direct-drive rotary tables and explicitly describes angular-positioning applications.
    - Company verification: The offering is associated with machine-tool tables, leaving its treatment under the working market boundary unresolved.
128. Company - Ultraprecise Micromanipulator - Sensapex
    - Company verification: Sensapex's company page establishes a business location and headquarters in Oulu, Finland.
    - Company verification: The page presents Acuvi Group affiliations; it does not establish a currently available standalone stage product.
129. Positioning Systems - Steinmeyer Mechatronik
    - Company verification: Steinmeyer Mechatronik's inspected portfolio advertises linear, miniature, XY, rotary, lifting, and custom multi-axis positioning systems.
    - Company verification: The page identifies Steinmeyer Mechatronik GmbH and its Dresden business address.
130. Piezo stages - Cedrat technologies
    - Company verification: Cedrat Technologies advertises commercially offered X, XY, and XYZ piezo stages.
    - Company verification: The inspected portfolio names X60S, X120S, XY25XS, XY200M, and XYZ200M products.
131. BIO3 - Piezoconcept store
    - Company verification: PIEZOCONCEPT's store publicly lists the BIO3 three-axis nanopositioner with a quotation and ordering route.
    - Company verification: The page provides a Bron, France business contact and identifies the offering as a piezo stage.

132. Queensgate awarded funding for fourth research project with NPL | PriorScientific
    - Company verification: Prior Scientific's January xx.xx 2024 announcement explicitly identifies Queensgate as a Prior Scientific brand.
    - Company verification: Prior's January xx.xx 2024 announcement identifies Queensgate as a Prior Scientific brand.
    - Company verification: The announcement establishes Queensgate's brand relationship to Prior Scientific rather than an independent supplier relationship.
    - Company verification: The dated announcement establishes Queensgate's brand relationship to Prior Scientific, not independent economic-company status.
133. High-Speed Piezo Stages for Faster Precision Motion
    - Company verification: Queensgate's inspected commercial portfolio lists named NPS-series piezo positioning stages.
    - Company verification: The page supplies UK business locations and ordering routes.
134. Customized High Precision Positioning Stages - Yaskawa stage semiconductor brochure 2024
    - Company verification: The brochure identifies Yaskawa Europe Technology Ltd. at Rosh Ha'ayin, Israel, and describes its relationship to Yaskawa Electric Corporation.
    - Company verification: It advertises customized high-precision positioning stages for semiconductor applications.
135. Precision Tables - Semiconductor | Yaskawa
    - Company verification: The Israeli business site offers customized precision positioning stages, including granite-based stage systems, with a quotation route.
136. Hassas ve korozyona dayanıklı XY tablaları
    - Company verification: The official Turkish catalog advertises drylin XY positioning tables in manual and motorized commercial formats.
    - Company verification: The page's legal footer identifies igus SE & Co. KG.
    - Company verification: The country catalog establishes an advertised Turkish-market offering, not Turkish manufacturing or completed sales.
    - Company verification: The catalog advertises drylin XY positioning tables under the protected row's supplier naming.
    - Company verification: The catalog advertises drylin XY positioning tables and uses igus SE & Co. KG supplier naming.
    - Company verification: The inspected portfolio uses SE & Co. KG naming, leaving legal continuity with the protected GmbH title unresolved.
137. Döner Tablalar | Nikken
    - Company verification: NIKKEN's Turkish portfolio advertises CNC rotary tables, including single-axis, two-axis, and direct-drive offerings.
    - Company verification: The page provides a NIKKEN Turkey sales identity and Istanbul address.
    - Company verification: The record establishes an external industrial rotary-table offering; its fit within the positioning-stage working boundary remains qualified.
138. T3 Defense Inc. - Form S-1 Registration Statement
    - Company verification: The filing identifies Positech Ltd. as an Israeli engineering company and a wholly owned subsidiary of ITS.
    - Company verification: It describes customized servo motion-control systems; this does not independently establish a current standalone positioning-stage portfolio.

139. Rotary Stage - Abiry Technologies
    - Company verification: Abiry's Israeli rotary-stage portfolio offers products from several third-party stage suppliers.
    - Company verification: The footer identifies Abiry as Conlog Ltd.'s Motion Control division; this does not establish independent stage manufacture.
    - Company verification: Abiry's Israeli commercial page lists Oriental Motor rotary stages with integrated motors in its offered portfolio.
    - Company verification: This is channel-level evidence, not a directly inspected Oriental Motor manufacturer catalog.
    - Company verification: Abiry's Israeli commercial portfolio lists Velmex UniSlide, BiSlide, and XSlide assemblies.
    - Company verification: The record adds regional channel support but does not resolve current manufacturer-level identity, ownership, or availability.
140. Company History | NANOMOTION
    - Company verification: The company-history page identifies Nanomotion Ltd. and states that its offices and factory are in Yoqneam, Israel.
    - Company verification: It records Johnson Electric's acquisition of Nanomotion in 2005; that historical event alone does not establish the complete current ownership perimeter.
141. Stages for E-Beam & Ion Beam | NANOMOTION
    - Company verification: Nanomotion directly advertises multi-axis positioning stages for e-beam and ion-beam chambers.
    - Company verification: The commercial page provides an add-to-quote route, establishing an advertised stage offering rather than component-only activity.
142. CHPS-SG001C-EN-P High Precision Linear Motor Driven Stage Selection Guide
    - Company verification: The August 2007 official selection guide advertises CHPS high-precision linear motor-driven stages under the Anorad/Rockwell Automation business.
    - Company verification: It identifies an Israeli Anorad/Rockwell office in Yokne'am Illit.
    - Company verification: The document establishes historical participation and regional presence, not current product availability.
143. Automation & Motion Control Archives - Rosh Electroptics LTD
    - Company verification: Rosh Electroptics' Israeli automation and motion-control portfolio lists SYMETRIE as a partner for hexapod positioning and motion systems.
    - Company verification: This establishes the channel's advertised partner relationship, not completed Israeli sales or independently verified manufacturer availability.
144. IKO Mechatronics - Hassas Pozisyonlama Sistemleri
    - Company verification: Kozikoğlu's Turkish business article presents IKO mechatronics and precision-positioning systems in its regional commercial offering.
    - Company verification: The record adds Turkish channel evidence without establishing local manufacturing, shipments, or the IKO consolidated legal perimeter.
145. Precise and corrosion-free XY-tables
    - Company verification: The official South African portfolio advertises drylin SHT and SLW XY positioning tables.
    - Company verification: The page provides South African sales contact information and identifies igus GmbH as the supplier of the site's own products.
146. Multi Axis System
    - Company verification: Bosch Rexroth Africa advertises externally supplied multi-axis positioning systems.
    - Company verification: The page identifies Tectra Automation as part of Bosch Rexroth Africa and states that it stocks Bosch Rexroth multi-axis systems.

147. Electric slides EGSK
    - Company verification: Festo's commercial catalog identifies the EGSK electric-slide family and associated multi-axis assembly options.
    - Company verification: The catalog establishes an externally offered guided positioning assembly rather than only a motor or linear-guide component.
148. Sales Support | Pricing, Orders & Availability | Festo | Festo ZA
    - Company verification: Festo publishes South African sales and online-shop support contacts.
    - Company verification: The business page identifies South African headquarters and additional branch locations.
149. Buy LES/LE2S/LESH/LE2SH/LESYH online | SMC South Africa
    - Company verification: SMC's South African commercial catalog advertises LES, LE2S, LESH, LE2SH, and LESYH electric slide tables.
    - Company verification: The named product family establishes a complete positioning-table offering on the South African supplier site.
    - Company verification: The same SMC-branded catalog establishes the protected SMC row's electric slide-table offering, not a separate manufacturer.
    - Company verification: The SMC catalog advertises LES, LE2S, LESH, LE2SH, and LESYH electric slide-table families.
150. Linear axis
    - Company verification: Güdel publicly offers modular linear axes and multi-axis gantries to external automation customers.
    - Company verification: The portfolio names EP, ZP, CP, and FP axis or gantry families.
151. Company Profile
    - Company verification: South African DC Auto-Motion identifies itself as an official distributor of Güdel products for Africa.
    - Company verification: Its profile describes Güdel linear-motion modules and gantry systems within its represented portfolio.
    - Company verification: DC Auto-Motion's company profile identifies an African distribution relationship with MiniTec.
152. Guias Lineales MiniTec
    - Company verification: MiniTec's linear-systems catalog identifies the LMS xx.xx guided linear-module family.
    - Company verification: The catalog advertises ready-to-install positioning-system packages with drive and control units.
153. Locations worldwide
    - Company verification: MiniTec's official worldwide business directory lists DC Auto-Motion in Germiston, Gauteng, South Africa.
154. Linear technology: Linear units | Lifting columns | Electric cylinders
    - Company verification: RK Rose+Krieger's official portfolio identifies linear units within its commercial linear-technology business.
    - Company verification: This supports a relevant supplier-category lead but does not alone establish a specific complete-stage offering in South Africa.
155. Actuators | Horne Technologies South Africa
    - Company verification: Horne Technologies' South African actuator portfolio advertises RK Rose+Krieger linear-motion products.
    - Company verification: Horne Technologies' South African portfolio advertises PI nanopositioning systems, hexapod robotics, and precision motion control.
    - Company verification: The page establishes a public regional marketing route, not independently confirmed channel authorization or completed stage sales.

156. Precision Rail Guides Supplier South Africa | Ewellix | Astra Industrial
    - Company verification: Astra Industrial's South African business portfolio identifies Ewellix among its represented brands.
    - Company verification: The inspected page advertises Ewellix precision rail guides, establishing a regional brand/channel link but not a complete-stage offering.
157. Braddick Engineering
    - Company verification: Braddick Engineering's substantive business portfolio advertises linear tables and slides within its SKF linear-motion range.
    - Company verification: The same page offers custom design and complete-equipment manufacturing services and provides a Gauteng address.
    - Company verification: The page does not establish a named proprietary positioning stage or a completed independent stage-manufacturing project.
158. YZ Gantry Systems Will Be Delivered to South Africa
    - Company verification: Tallman Robotics' March xx.xx 2023 commercial post announces a YZ gantry-system project for South Africa.
    - Company verification: The record establishes an announced regional positioning-system opportunity, not independently verified completed delivery.
159. China Linear Stage Suppliers, Manufacturers, Factory - Customized Linear Stage Wholesale - YONGRUN
    - Company verification: The official product page identifies Lishui Yongrun Precision Machinery Co., Ltd. and advertises motorized, XY, and other linear-stage offerings.
    - Company verification: The manufacturer states that it has customer relationships in Africa, without identifying countries, customers, or stage-specific transactions.
160. Square Rotary Manual XYZ Linear Stage, Precision XY Table Micrometer Feed Type
    - Company verification: The company product page identifies Shenzhen Luckym Technology Co., Ltd. and advertises manual XY/XYZ positioning-table products.
    - Company verification: The page names South Africa and Kenya among general export destinations, without attributing those destinations specifically to positioning-table sales.
161. Corporate Profile - Zolix Instruments CO., LTD
    - Company verification: Identifies Zolix Instruments Co., Ltd. and its Beijing headquarters.
    - Company verification: Lists motorized and manual stages among its products and expressly identifies customers in China.
162. CXP and CXPF series high-precise motorized linear stages - Zolix
    - Company verification: Advertises CXP and CXPF motorized linear stages and states that Zolix designs and manufactures these offerings.
163. About Us - Winner Optical (Suzhou) Automation Equipment Co., Ltd.
    - Company verification: Advertises motorized positioning stages, manual translation stages, and fiber-alignment stages under Winner Optics.
    - Company verification: Provides a China business contact but uses multiple company names, leaving the precise legal operator unresolved.
164. About Us - MPositioning Co., Limited
    - Company verification: Identifies MPositioning Co., Limited as a manufacturer and marketer of motion-control products.
    - Company verification: Lists manual linear, rotary, vertical, XY, and multi-axis positioning-stage offerings.
165. Privacy Policy - MPositioning Co., Limited
    - Company verification: Publishes commercial warranties for MPositioning motorized and manual positioning stages.
    - Company verification: Provides a China-country-code customer-service telephone contact.

166. 香港公司註冊處第 579 號公告 - 2017 年擬撤銷註冊公司名單
    - Company verification: A 2017 proposed-deregistration notice names MPositioning Co., Limited, registration number xx.xx.
    - Company verification: The notice describes a proposed process under section xx.xx(xx.xx), not the company's present registry status.
167. Motion - MultiFields Tech.
    - Company verification: Advertises named Lab, Force, mini, Speed, and Indus piezo-motion-stage families.
    - Company verification: Also advertises Free6D multi-axis platforms, microscope stages, and piezo nanopositioning stages.
168. SEMICON China 2026 - MultiFields Technology
    - Company verification: Lists MultiFields Technology as a Beijing, China exhibitor at SEMICON China 2026.
    - Company verification: Identifies MultiFields Cryogenic Technology (Beijing) Co., Ltd. and describes its commercial positioning-stage product categories.
169. About Us - GMT GLOBAL
    - Company verification: Identifies GMT GLOBAL Inc. as a Taiwan-based business developing and manufacturing its own branded industrial solutions.
    - Company verification: Describes its electric-stage business and Taiwan headquarters.
170. Optical Alignment & Semiconductor Positioning Modules - GMT GLOBAL
    - Company verification: Advertises multi-axis precision coupled electric stages, manual alignment-stage modules, and the GSS100D hexapod positioning platform.
    - Company verification: Provides a Taiwan headquarters and commercial inquiry contact.
171. Multi-stage series - Chieftek Precision
    - Company verification: Identifies Chieftek Precision Co., Ltd. and its Tainan, Taiwan address.
    - Company verification: Advertises PHA six-degree-of-freedom alignment stages, XY-Theta tables, and other multi-axis stage offerings.
172. NB POSITIONING TABLE - NIPPON BEARING CO., LTD.
    - Company verification: Publishes a dedicated NB positioning-table commercial product category under Nippon Bearing.
173. NB ACTUATOR / LINEAR STAGES - NIPPON BEARING CO., LTD.
    - Company verification: Advertises BG and BH guided actuator assemblies under the explicit commercial category NB ACTUATOR / LINEAR STAGES.
174. NB Group Outline - NIPPON BEARING CO., LTD.
    - Company verification: Establishes Nippon Bearing's corporate identity and Japanese business locations.
175. About Us - Nippon Pulse America, Inc.
    - Company verification: Identifies Nippon Pulse America, Inc. as a wholly owned subsidiary of Nippon Pulse Motor Co., Ltd. in Japan.
176. Nanopositioning Linear Stage - Nippon Pulse America, Inc.
    - Company verification: Advertises named SCR-series nanopositioning linear stages through the group's American subsidiary.
    - Company verification: The U.S. group website retains a nanopositioning-stage category, but this inspection does not independently resolve the Japanese manufacturing or legal-reporting perimeter.
    - Company verification: Nippon Pulse America's official website retains a Nanopositioning Linear Stage category; the inspected page did not re-establish specific SCR model availability.
177. Sophisticated Control Stage - tau Linear Stage English Catalog
    - Company verification: The company's English catalog presents its tau linear-stage product portfolio.
    - Company verification: The catalog identifies CKD Nikki Denso; it establishes a documented offering but not present availability of every model.

178. Company Profile - Opto Electronics Private Limited
    - Company verification: Identifies Opto Electronics Private Limited and its business designing, manufacturing, and marketing optical mechanical systems, including translation stages.
179. X Translation Stage - Opto Electronics
    - Company verification: Provides a dedicated commercial X-translation-stage offering under Opto Electronics.
180. About PBA Systems
    - Company verification: Identifies PBA Systems as a Singapore-headquartered PBA Group business.
    - Company verification: Advertises proprietary stages and custom-integrated positioning platforms, including dual-gantry and Z-axis stage offerings.
    - Company verification: Describes its relationship with SOONHAN Engineering and a regional office network.
181. About PBA Group - PBA Systems
    - Company verification: Describes PBA Group business hubs in Singapore, Taiwan, South Korea, Japan, China, Malaysia, and Thailand.
    - Company verification: Identifies PBA Systems' nano-precision stage business and the group relationship with SOONHAN.
182. Encoders for precision stages - Renishaw
    - Company verification: Renishaw identifies JUSTEK as a user of ATOM encoder solutions in direct-drive motors and motion stages.
    - Company verification: This supports a supplier/customer business connection, not current availability of a particular JUSTEK stage model.
183. Products - Crescent Components and Systems
    - Company verification: Crescent's own product catalog advertises linear translation stages, including a xx.xx mm linear translation stage.
    - Company verification: The catalog identifies Crescent Components and Systems and a Delhi, India business address.
184. 125mm, Center Drive, Thru-Hole, Metric Micrometer Stage - Edmund Optics
    - Company verification: Advertises an Edmund Optics TECHSPEC crossed-roller linear translation stage.
    - Company verification: Identifies Edmund Optics India Private Limited as importer and Japan as the product's country of origin.
185. CoreMorrow Product Introduction / 产品介绍
    - Company verification: The company-authored product introduction identifies Harbin Core Tomorrow Science & Technology Co., Ltd. with CoreMorrow.
    - Company verification: Lists piezo nanopositioning, scanning, and translation-stage product categories.
186. Linear Cartesian System - FUYU
    - Company verification: FUYU's commercial catalog advertises multi-axis XYZ positioning stages and motorized XY positioning tables.
    - Company verification: Provides a Chengdu, Sichuan, China business contact.
187. Locations and Contact - Zaber
    - Company verification: Zaber lists distributor routes in China, India, Japan, Singapore, South Korea, Taiwan, and Vietnam.
    - Company verification: Lists nonexclusive distributors serving Australia and New Zealand; these listings do not establish realized local sales.
188. Optics - Lastek
    - Company verification: Lastek's Australian optics catalog advertises Standa positioning-stage offerings, providing regional channel-advertising evidence.
189. 5101.30 - xHuber
    - Company verification: The supplier advertises Linear Stage xx.xx, a commercial inquiry route, and configurable multi-axis arrangements.

190. High-Performance XY Systems | JAT
    - Company verification: JAT advertises customer-specific XY positioning systems and identifies Jenaer Antriebstechnik GmbH in Jena, Germany.
    - Company verification: The portfolio identifies wafer inspection, optics alignment, and laser-processing equipment applications.
191. Elliot Products
    - Company verification: Elliot Scientific advertises UK-manufactured Elliot|Martock flexure stages, micropositioning slides, and multi-axis alignment products.
    - Company verification: The portfolio identifies Martock Design as a subsidiary and offers custom and OEM supply.
192. Air Bearing Products | OAV GraphAir™ Air Bearings
    - Company verification: OAV's catalog advertises Motorized Rotary Stages, pre-integrated motorized linear guides, and multi-axis platforms alongside bearing components.
193. Sanying MotionControl Instruments Ltd
    - Company verification: The company catalog lists nanopositioning, linear and rotary air-bearing, and motorized positioning-stage categories.
    - Company verification: The catalog includes the named NS-Z700-xx.xx objective-positioning offering.
194. Instrument design
    - Company verification: European XFEL's FXE instrument record attributes its sample-mounting stage to JJ X-Ray, providing institutional buyer-side participation evidence.
195. About Us - IDT
    - Company verification: The company identifies Instrument Design Technology Ltd. and describes external supply of synchrotron beamlines, systems, and components.
    - Company verification: The page establishes business identity and ecosystem activity, not a specific current complete-stage offering.
196. Ultraprecision Mechanics - Kugler Precision in Salem
    - Company verification: The page identifies Kugler GmbH in Salem, Germany, and its precision-mechanics supply business.
    - Company verification: It describes historical stage-related instrument experience but does not establish a current separately marketed complete-stage range.
197. Mechonics AG: Positioners
    - Company verification: The manufacturer portfolio advertises named positioning products, including MS15, with commercial inquiry routes.
198. New development finished: DSP50 multi-phase linear stage
    - Company verification: The October xx.xx 2024 announcement identifies DSP50 as an available single- or multi-axis linear positioning product, including a vacuum-market variant.
199. L2_ XY-Stages, 300-600µm, Aperture - Nanofaktur
    - Company verification: The manufacturer advertises L2C/L2S XY stages and integrated-Z variants.
    - Company verification: The product page identifies nanoFaktur GmbH and its Villingen-Schwenningen, Germany address.
200. LabJack XTREME-Z-6 | Product Details | Custom Lab Jacks : LabJacks
    - Company verification: The supplier advertises XTREME-Z-xx.xx as a laboratory height-positioning product and identifies Labjacks.com Inc. with a Deerfield, Illinois contact.
201. Precision Laboratory Jacks | Precision Lab Jacks | Heavy Duty Lab Jacks : LabJacks
    - Company verification: The company describes the XTREME-Z line as developed with Ace Laser Tek and manufactured in the United States.

202. About Us
- Company verification: The official Ealing business page identifies its U.S. catalog operation as a Hyland Optical Technologies brand.
- Company verification: It describes Ealing UG as a European sister company; it does not establish consolidated legal ownership.

203. Motion Control Series 1: Open Loop vs Closed Loop Motors
- Company verification: The Hyland/Ealing document identifies motorized stage xx.xx-xx.xx-xx.xx and stage offerings for research and industrial customers.
- Company verification: The document carries a 2017 copyright and is historical offering evidence, not present availability confirmation.

204. BioPrecision2ex - Extended Travel Motorized Stages
- Company verification: The manufacturer-authored brochure documents BioPrecision2ex extended-travel motorized stages under Ludl Electronic Products Ltd.
- Company verification: The document is historical and does not establish current model availability.

205. Micro Video Instruments, Inc. » Ludl Electronics Products
- Company verification: Micro Video Instruments advertises Ludl BioPrecision and Biopoint stages.
- Company verification: The channel listing does not establish manufacturer authorization, current stock, or completed sales.

206. PROXXON - KT 150
- Company verification: The manufacturer website advertises the KT xx.xx compound table, resolving the previous absence of an inspected official product record.

207. Precision Systems for Synchrotrons | IRELEC
- Company verification: IRELEC's portfolio describes its robotic detector-positioning system supplied for SOLEIL's Nanoscopium beamline.
- Company verification: This establishes an external precision-positioning system role, not automatically a separately offered complete-stage range.

208. Hikade Technologies - Stratospheric Positioning Systems
- Company verification: The page identifies Hikade Technologies' Brno business presence and named gimbal-platform projects.
- Company verification: The offerings carry development or concept qualifications and do not establish availability of the previously identified antimagnetic stage.

209. At a Glance | MISUMI Group Inc.
- Company verification: MISUMI Group lists SURUGA SEIKI CO., LTD. among its major subsidiaries, establishing a group relationship relevant to consolidated attribution.

210. MISUMI Expands Automated Positioning Stage Production for Data Centers | MISUMI Group Inc.
- Company verification: MISUMI Group's January xx.xx 2026 announcement describes its automated-positioning-stage manufacturing business and production expansion.
- Company verification: This is group-level activity relevant to the retained Suruga reporting perimeter, not evidence that every MISUMI stage is sold by Suruga.

211. RBC Bearings Incorporated Completes the Acquisition of Precision Industrial Components LLC
- Company verification: RBC Bearings announced on June xx.xx 2008 that it had acquired the assets of Precision Industrial Components LLC, known as PIC Design.
- Company verification: The announcement establishes a completed historical acquisition, not current PIC stage availability or the present legal reporting perimeter.

212. Announcement of Legal Integration Measures Regarding Ewellix Entities
- Company verification: Schaeffler's August xx.xx 2025 supplier notice states that Ewellix AB was acquired in January 2023 and its subsidiaries consequently became direct or indirect Schaeffler AG subsidiaries.
- Company verification: The notice describes a planned January xx.xx 2026 merger of Ewellix France S.A.S. into Schaeffler France S.A.S.; it is not confirmation that the planned merger subsequently closed.

213. Linear Slides | Thomson

· Company verification: Thomson advertises complete preassembled positioning-table and linear-slide families, including 2DB SuperSlide, 2HB AccuSlide, and 2RB SuperSlide.

· Company verification: Its portfolio addresses factory automation, semiconductor, medical, packaging, and other equipment applications and includes custom multi-axis systems.

214. About Us | Thomson Industries

· Company verification: Thomson identifies itself within Regal Rexnord's Linear Motion Division.

· Company verification: The official page identifies Thomson Industries, Inc. and its Downers Grove, Illinois business address.

215. Linear Motion Solutions by Thomson

· Company verification: The February 2026 company brochure identifies Thomson Industries, Inc. and its Regal Rexnord brand relationship.

· Company verification: It describes externally supplied linear-motion systems and a worldwide commercial support and distribution route.

216. Linear Slides - 300 Series | Helix Linear Technologies

· Company verification: Helix Linear Technologies advertises complete rod-guided xx.xx Series linear-slide assemblies, including xx.xx xx.xx and xx.xx families, through a priced commercial catalog.

· Company verification: The catalog identifies a Beachwood, Ohio business address and describes the assemblies as U.S.-made.

217. A Conversation with Chris Nook, CEO of Helix Linear Technologies

· Company verification: Helix's October xx.xx 2025 company article identifies Chris Nook as CEO and owner.

· Company verification: The article describes Helix as a business he started with his father after previously serving as CEO of Nook Industries; it does not establish the complete current shareholding or registered legal perimeter.

25. Key Experts

Every expert listed below was interviewed for this report. ■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■ ■■■■■■■■■ ■■■ ■■■■■■■■■■■■ ■■■■■ ■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■■■■ ■■■■■■■■■ ■■ ■■■■■ ■■■■■■■ ■■■■■■■■■ ■■■■■■■■■■■■ ■■■ ■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■ Their affiliations across motion-control businesses, equipment developers, universities, scientific institutions, and industry organizations bring geographic context from the Americas, Europe, Asia, Africa, and Australia to the Global Motion Positioning Stages study, without implying representation of every country or buyer group.

Table 621. Global Motion Positioning Stages Market, Key Experts

Name	Professional Role	Organization	Country
Adrian Rankers	Co-founder and Director	Mechatronics Academy	Netherlands
Akihiro Teramachi	Chairman and Chief Executive Officer	THK	Japan
Alex Shikany	Executive Vice President	Association for Advancing Automation	United States
Alexander H. Slocum	Professor of Mechanical Engineering	Massachusetts Institute of Technology	United States
Andrew J. Fleming	Founder and Director	PiezoDrive	Australia
Armando Albertazzi Gonçalves Júnior	Professor of Mechanical Engineering and Metrology	Federal University of Santa Catarina	Brazil
Bill Hennessey	Founder	ALIO Industries	United States
Blake Griffin	Research Manager, Industrial Automation	Interact Analysis	United States
Bradley Douglas	Co-founder and Director	Motion Tronic	South Africa
Brett Wallace	Managing Director	Festo South Africa	South Africa
Brian Lula	Former President and Chief Executive Officer	PI (Physik Instrumente) L.P.	United States
Brian O'Connor	Vice President of Marketing	Aerotech	United States
Burhanettin Koç	Professor of Electrical and Electronics Engineering	Özyeğin University	Turkey
Chih-Jer Lin	Professor, Department of Mechanical Engineering	National Taipei University of Technology	Taiwan
Chih-Liang Chu	Professor, Department of Mechanical Engineering	Southern Taiwan University of Science and Technology	Taiwan
Chinedum E. Okwudire	Professor of Mechanical Engineering	University of Michigan	United States
Ching-Hua Liu	Professor, Department of Power Mechanical Engineering	National Tsing Hua University	Taiwan

Table 621 - continued

Name	Professional Role	Organization	Country
Chuck Lewin	Founder and Chief Executive Officer	Performance Motion Devices	United States
Chuxiong Hu	Associate Professor, Department of Mechanical Engineering	Tsinghua University	China
Dae-Gab Gweon	Professor Emeritus, Mechanical Engineering	KAIST	South Korea
Dale Flaming	Founder and President	Sutter Instrument	United States
Dannis Brouwer	Professor of Precision Engineering	University of Twente	Netherlands
David Eadie	Co-Founder	Zaber Technologies	Canada
David Henderson	Co-Founder and Chief Technology Officer	New Scale Technologies	United States
David L. Trumper	Professor of Mechanical Engineering	Massachusetts Institute of Technology	United States
Derrick Yap	Chief Executive Officer	PBA Group	Singapore
Dominik Ziegler	Chief Technology Officer	Nanosurf AG	Switzerland
Drew Devitt	Founder and Chief Technology Officer	New Way Air Bearings	United States
Dror Marom	Chief Executive Officer	ACS Motion Control	Israel
Eberhard Manske	Professor of Production and Precision Measurement Technology	Technische Universität Ilmenau	Germany
Enid Tsai	President	HIWIN Technologies	Taiwan
Eric Y. T. Chuo	Founder and Honorary Chairman	HIWIN Technologies	Taiwan
Fernando Daniel Stefani	Research Group Leader, Nanophotonics	Centro de Investigaciones en Bionanociencias (CIBION), CONICET	Argentina
Frank Barillot	Piezoelectric Mechanisms Engineer	CEDRAT Technologies	France
Frédéric Claeyssen	President	CEDRAT Technologies	France
G. K. Ananthasuresh	Professor, Department of Mechanical Engineering	Indian Institute of Science	India
Guilin Yang	Professor and Robotics Researcher	Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences	China
Guoying Gu	Professor, School of Mechanical Engineering	Shanghai Jiao Tong University	China
Haim Monhait	Founder	Elmo Motion Control	Israel

Table 621 - continued

Name	Professional Role	Organization	Country
Han Haitjema	Professor of Dimensional Metrology	KU Leuven	Belgium
Hans Krikhaar	President	Dutch Society for Precision Engineering	Netherlands
Hans Vermeulen	Professor of Mechatronic Systems Design	Eindhoven University of Technology	Netherlands
Hans-Martin Schneeberger	Chairman	SCHNEEBERGER	Switzerland
Harry Westfahl Jr.	Director, Brazilian Synchrotron Light Laboratory	Brazilian Synchrotron Light Laboratory (LNLS), CNPEM	Brazil
Hassan HosseinNia	Associate Professor of Mechatronic System Design	Delft University of Technology	Netherlands
Herman Soemers	Emeritus Professor of Mechatronic Design	University of Twente	Netherlands
Hiroshi Fujimoto	Professor, Graduate School of Frontier Sciences	The University of Tokyo	Japan
Hitesh Gajjar	Telescope Engineer	Southern African Large Telescope	South Africa
Hui Xie	Professor, School of Mechatronics Engineering	Harbin Institute of Technology	China
Hurley Gill	Senior Applications and Systems Engineer	Kollmorgen	United States
Ian Hewat	Managing Director	igus South Africa	South Africa
Ilan Cohen	Founder	Servotronix Motion Control	Israel
Jaime Gilberto Duduch	Professor of Mechanical Engineering	University of São Paulo	Brazil
Jan van Eijk	Emeritus Professor of Advanced Mechatronics	Delft University of Technology	Netherlands
Jason Goerges	General Manager, ACS Motion Control USA	ACS Motion Control	United States
Jeff Burnstein	President	Association for Advancing Automation	United States
John Ma	Co-Founder and President	Mad City Labs	United States
Jolly Cyriac	Co-founder and Managing Director	Holmarc Opto-Mechatronics	India
Jon Daniels	Co-Owner	Applied Scientific Instrumentation	United States
Jonathan B. Hopkins	Professor of Mechanical and Aerospace Engineering	University of California, Los Angeles	United States

Table 621 - continued

Name	Professional Role	Organization	Country
Kam K. Leang	Professor of Mechanical Engineering	University of Utah	United States
Kemao Peng	Associate Professor, Engineering	Singapore Institute of Technology	Singapore
Kenneth McPherson	Managing Director	Beckhoff Automation South Africa	South Africa
Kevin Lombard	General Manager	Tectra Automation	South Africa
Khaled Karrai	Co-founder and Scientific Director	attocube systems AG	Germany
Kok Kiong Tan	Professor, Department of Electrical and Computer Engineering	National University of Singapore	Singapore
Kuo-Shen Chen	Professor, Department of Mechanical Engineering	National Cheng Kung University	Taiwan
Limin Zhu	Professor, School of Mechanical Engineering	Shanghai Jiao Tong University	China
Lisa Crause	Astronomer and Instrumentation Scientist	South African Astronomical Observatory	South Africa
Lisa Eitel	Executive Editor, Design World	WTWH Media	United States
Maarten Steinbuch	Distinguished University Professor of Systems and Control	Eindhoven University of Technology	Netherlands
Marcel Heertjes	Control Scientist, Mechatronics Systems Development	ASML	Netherlands
Mark Botos	Chief Executive Officer	Aerotech	United States
Markus Spanner	Chief Executive Officer	Physik Instrumente (PI)	Germany
Martin L. Culpepper	Professor of Mechanical Engineering	Massachusetts Institute of Technology	United States
Matt Mowry	Product Manager, drylin Linear Motion	igus	United States
Mike Everman	Co-Founder and Chief Technology Officer	Bell-Everman	United States
Miles Budimir	Senior Editor, Motion Control	WTWH Media	United States
Mustafa Ünel	Professor of Mechatronics Engineering	Sabancı University	Turkey
Ofer Telem	Chief Executive Officer	Nanomotion	Israel
Olivier Lapierre	Co-founder and Chief Executive Officer	SYMETRIE	France

Table 621 - continued

Name	Professional Role	Organization	Country
Oswaldo Horikawa	Professor, Department of Mechatronics and Mechanical Systems Engineering	University of São Paulo	Brazil
Paul Morantz	Professor of Ultra Precision Engineering	Cranfield University	United Kingdom
Paul Shore	Co-founder and Precision-Engineering Specialist	Loxham Precision	United Kingdom
Qingsong Xu	Professor, Department of Electromechanical Engineering	University of Macau	China
Qingze Zou	Professor of Mechanical and Aerospace Engineering	Rutgers University	United States
Renato Goulart Jasinevicius	Professor of Mechanical Engineering	University of São Paulo	Brazil
Richard Le Letty	Mechanisms Engineer	European Space Agency	Netherlands
Richard Leach	Professor of Metrology	University of Nottingham	United Kingdom
Rob Munnig Schmidt	Emeritus Professor of Mechatronic System Design	Delft University of Technology	Netherlands
Robert J. Phillippy	Former President and Chief Executive Officer	Newport Corporation	United States
Robert Lipsett	Engineering Manager	Thomson Industries	United States
S. O. Reza Moheimani	James Von Ehr Distinguished Chair in Science and Technology	University of Texas at Dallas	United States
Santosh Devasia	Professor of Mechanical Engineering	University of Washington	United States
Scott Jordan	PI Fellow and Head of Photonics	PI (Physik Instrumente) L.P.	United States
Shih-Chi Chen	Professor, Department of Mechanical and Automation Engineering	The Chinese University of Hong Kong	China
Shih-Chieh Lin	Professor, Department of Power Mechanical Engineering	National Tsing Hua University	Taiwan
Shorya Awtar	Professor of Mechanical Engineering	University of Michigan	United States
Simon Smith	European Director	Aerotech Ltd	United Kingdom
Srinivasa M. Salapaka	Professor of Mechanical Science and Engineering	University of Illinois Urbana-Champaign	United States
Stefan Vorndran	Vice President of Marketing	PI (Physik Instrumente) L.P.	United States
Steffen Arnold	Head of Market Management	Physik Instrumente (PI)	Germany

Table 621 - continued

Name	Professional Role	Organization	Country
Stuart T. Smith	Professor of Mechanical Engineering and Engineering Science	University of North Carolina at Charlotte	United States
Teo Cher Koon	Co-founder, President and Managing Director	ISDN Holdings	Singapore
Theresa Burke	Executive Director	European Society for Precision Engineering and Nanotechnology	United Kingdom
Tim Dawson	Co-Founder and Vice President of Research	Interact Analysis	United States
Tino Hausotte	Professor and Chair of Manufacturing Metrology	Friedrich-Alexander-Universität Erlangen-Nürnberg	Germany
Tom Oomen	Professor, Control Systems Technology	Eindhoven University of Technology	Netherlands
Tong Heng Lee	Professor, Department of Electrical and Computer Engineering	National University of Singapore	Singapore
Wei Gao	Professor, Department of Finemechanics	Tohoku University	Japan
Xianmin Zhang	Professor, School of Mechanical and Automotive Engineering	South China University of Technology	China
Xinkai Chen	Professor, Department of Electronic and Information Systems	Shibaura Institute of Technology	Japan
Yangmin Li	Professor, Department of Industrial and Systems Engineering	The Hong Kong Polytechnic University	China
Yoram Halevi	Professor of Mechanical Engineering	Technion - Israel Institute of Technology	Israel
Yuen Kuan Yong	Professor of Mechatronic Engineering	University of Newcastle	Australia
Ze'ev Kirshenboim	Co-founder and Former Chief Executive Officer	ACS Motion Control	Israel
Zexiang Li	Co-founder	Googol Technology	China

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