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Global Rotary Actuators for Humanoid Robots Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global Rotary Actuators for Humanoid Robots market size was valued at US$ 75.11 million in 2025 and is forecast to a readjusted size of US$ 1177 million by 2032 with a CAGR of 46.9% during review period.

In 2025, global Rotary Actuators for Humanoid Robots capacity 240 k Units, sales reached approximately 231 k Units, with an average market price of around 317 USD/Unit, industrial gross margin 41%.

Rotary Actuators for Humanoid Robots are no longer “just joints.” They are the performance-and-cost anchor that determines whether a humanoid can move with authority, survive real duty cycles, and ship repeatedly with predictable quality. As programs transition from prototypes to replicable builds, the actuator becomes the shared bottleneck: arms demand bandwidth and backdrivability for safe interaction; legs demand stiffness, shock tolerance, and fatigue life; torso and neck prioritize stability and low acoustic signature. In practice, Rotary Actuators for Humanoid Robots are judged by system delivery—power density plus thermal headroom plus consistency—rather than by a single peak metric.

The key evaluation set for Rotary Actuators for Humanoid Robots tends to converge on six engineering “truths”: (1) peak vs. continuous torque and torque density, (2) joint speed/acceleration and usable control bandwidth, (3) backlash and torsional stiffness under load, (4) force/impedance control capability and sensor stack quality, (5) thermal rise and heat-flow architecture, and (6) sealing/robustness for industrial handling. The dominant architecture is the integrated joint module: a frameless torque motor or flat

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BLDC + precision reduction (harmonic/cycloidal RV/planetary) + cross-roller bearing + absolute encoder (increasingly dual-encoder, multi-turn) + embedded FOC drive with CANopen/EtherCAT. The industry direction is clear: integration pushes intelligence down into the joint—single-cable wiring, position retention behavior, built-in protection and diagnostics, and calibration routines become part of the actuator, not the robot.

Supplier dynamics reflect “critical-component pull” and “system-integration tiers.” Harmonic-drive-based servo actuators remain compelling when compact packaging, high positional accuracy, and near-zero backlash are the priority; cycloidal RV solutions typically win where large torque, long life, and shock tolerance dominate; frameless motor platforms compete on torque density, manufacturability, and the ability to scale from prototype to full production without redesign; bearings and encoders often set the true ceiling on lifetime and repeatability. The Rotary Actuators for Humanoid Robots value chain therefore runs from upstream magnetic materials and electrical steel, specialty steels and bearing steels, into midstream stator/rotor manufacturing, precision gearing with heat treatment and grinding, drives and power electronics, and then into joint modules and final assembly. The hard moat is rarely “the CAD model”—it is distortion control in heat treatment, contact fatigue on gear/race surfaces, dual-encoder calibration, motor-drive tuning, and statistical process control that keeps batch-to-batch behavior within tight limits.

Commercial momentum is increasingly visible through designated sourcing and framework agreements that freeze specs early. In December 2025, Zhongyuan Neipei disclosed a strategic cooperation framework with Ningbo Puzhi Future Robot. One explicit objective is that, after supplier qualification, the subsidiary aims to become a core supplier of humanoid robot joint modules, with a five-year cooperation term. The disclosure also emphasizes process and manufacturing commonality between robot joint modules and established electromechanical actuators—an important signal that automotive-grade manufacturing discipline (quality systems, supply-chain control, traceability) is moving into Rotary Actuators for Humanoid Robots as a practical route to scale.

The growth engine for Rotary Actuators for Humanoid Robots is shifting from “peak performance” to “platform cost-down and supply resilience.” Expect continued upward integration (embedded drives, simplified harnessing, dual absolute encoders, built-in diagnostics), clearer module standardization (high-torque/high-stiffness leg joints; high-bandwidth/backdrivable arm joints; highly integrated miniature hand joints), and thermal design becoming the mass-production separator (heat paths, grease life, drift

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compensation under long duty cycles). Upstream magnet supply is now a first-order design constraint: on Oct 9, 2025, China's MOFCOM Announcement No. 61 implemented export controls covering specified rare-earth items and items containing rare-earth permanent magnet materials; in July 2025, MP Materials and Apple announced a US$500 million partnership to produce recycled rare-earth magnets in the U.S., while MP Materials also announced a public-private partnership with the U.S. defense-related side to accelerate domestic magnet independence; in Oct 2025, Lynas announced expansion of heavy rare earth separation capacity in Malaysia. For actuator makers, the practical responses are already visible: magnet recipes that reduce heavy-rare-earth dependence, recycling loops and dual-sourcing qualification, and elevating manufacturability metrics (yield, consistency, traceability) to the same status as torque density.

This report is a detailed and comprehensive analysis for global Rotary Actuators for Humanoid Robots market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Power and by Application. As the market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global Rotary Actuators for Humanoid Robots market size and forecasts, in consumption value ($ Million), sales quantity (K Units), and average selling prices (US$/Unit), 2021-2032

Global Rotary Actuators for Humanoid Robots market size and forecasts by region and country, in consumption value ($ Million), sales quantity (K Units), and average selling prices (US$/Unit), 2021-2032

Global Rotary Actuators for Humanoid Robots market size and forecasts, by Power and by Application, in consumption value ($ Million), sales quantity (K Units), and average selling prices (US$/Unit), 2021-2032

Global Rotary Actuators for Humanoid Robots market shares of main players, shipments in revenue ($ Million), sales quantity (K Units), and ASP (US$/Unit), 2021-2026

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The Primary Objectives in This Report Are:

To determine the size of the total market opportunity of global and key countries
To assess the growth potential for Rotary Actuators for Humanoid Robots
To forecast future growth in each product and end-use market
To assess competitive factors affecting the marketplace

This report profiles key players in the global Rotary Actuators for Humanoid Robots market based on the following parameters - company overview, sales quantity, revenue, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Shenzhen Inovance Technology, Ningbo Tuopu Group, Zhejiang Sanhua Intelligent Controls, Zhejiang XCC Group, ZeroErr, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Market Segmentation

Rotary Actuators for Humanoid Robots market is split by Power and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Power, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market segment by Power

Hydraulic Type

Pneumatic Type

Electric Type

Market segment by Type

Rigid Type

Elastic Type

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Collimation Type

Market segment by Application

Biped Humanoid Robot

Wheeled Humanoid Robot

Major players covered

Shenzhen Inovance Technology

Ningbo Tuopu Group

Zhejiang Sanhua Intelligent Controls

Zhejiang XCC Group

ZeroErr

Market segment by region, regional analysis covers
North America (United States, Canada, and Mexico)
Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)
Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)
South America (Brazil, Argentina, Colombia, and Rest of South America)
Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

The content of the study subjects, includes a total of 15 chapters:

Chapter 1, to describe Rotary Actuators for Humanoid Robots product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Rotary Actuators for Humanoid Robots, with price, sales quantity, revenue, and global market share of Rotary Actuators for

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Humanoid Robots from 2021 to 2026.

Chapter 3, the Rotary Actuators for Humanoid Robots competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Rotary Actuators for Humanoid Robots breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Power and by Application, with sales market share and growth rate by Power, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales quantity, consumption value, and market share for key countries in the world, from 2021 to 2026.and Rotary Actuators for Humanoid Robots market forecast, by regions, by Power, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

Chapter 13, the key raw materials and key suppliers, and industry chain of Rotary Actuators for Humanoid Robots.

Chapter 14 and 15, to describe Rotary Actuators for Humanoid Robots sales channel, distributors, customers, research findings and conclusion.

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