

Global Optical Encoder for Robot 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 Optical Encoder for Robot market size was valued at US\$ 734 million in 2025 and is forecast to a readjusted size of US\$ 1547 million by 2032 with a CAGR of 11.2% during review period.

An optical encoder for robots is a precision position-feedback device that uses optical scanning, code discs, glass scales, or grating structures to measure angular or linear movement in robot joints, servo motors, rotary axes, and linear motion modules. It converts mechanical displacement into electrical signals, enabling accurate position, speed, and direction control. In robotics, optical encoders are widely used in industrial robots, collaborative robots, semiconductor handling robots, surgical robots, and precision automation equipment. They are especially suitable for applications requiring high resolution, repeatability, low signal noise, and accurate joint-position feedback.

Global production capacity is approximately 7 million units.

In 2025, global sales reached approximately 5.8 million units, with an average price of around US\$ 123 per unit, gross margin around 35%.

The optical encoders remain one of the most important encoder technologies for high-performance robots. Their advantages in resolution, accuracy, signal stability, and repeatability make them highly suitable for industrial robots, semiconductor robots, medical robots, and other precision automation systems. Although magnetic and inductive encoders are gaining share in harsh-environment and compact applications, optical encoders will continue to dominate high-end robotic motion-control scenarios. Future competition will focus on miniaturization, absolute feedback, hollow-shaft design,

safety functions, digital communication, and easier integration into robot joints and servo systems. The market outlook remains positive as robots move toward higher precision and intelligence.

Market Trend

The optical encoder for robot market is moving toward higher accuracy, compact design, absolute position feedback, hollow-shaft structures, and integration with robot joints and servo motors. As robots are increasingly used in semiconductor, electronics, medical, aerospace, and precision assembly applications, demand is rising for optical encoders with higher resolution and better signal stability. Secondary encoders mounted downstream from the gearbox are becoming more common to improve actual robot joint-position accuracy. In addition, miniaturized optical encoders are gaining attention in compact robotic arms, direct-drive rotary stages, and high-precision automation modules.

Market Drive

The main driver of the optical encoder for robot market is the need for precise, repeatable, and stable motion control. Industrial robots and collaborative robots require accurate position feedback to improve tool-center-point accuracy, reduce positioning errors, and support high-speed operation. Semiconductor wafer handling, medical robotics, precision machining, and electronics assembly all require robots with excellent motion stability and low vibration. Optical encoders provide high resolution and low-noise feedback, making them important for premium robot applications. Growth in smart manufacturing, factory automation, and high-end robotics continues to support demand for optical encoder solutions.

Upstream and Downstream

The upstream side of optical encoders for robots includes optical chips, LEDs, photodiodes, glass or metal code discs, grating scales, optical readheads, bearings, precision housings, PCBs, connectors, cables, and signal-processing ICs. Downstream customers mainly include robot OEMs, servo motor manufacturers, joint-module suppliers, automation system integrators, and end users in automotive, electronics, semiconductor, healthcare, logistics, and precision manufacturing industries. Robot use cases include joint feedback, rotary-axis control, wafer handling, and direct-drive stages.

This report is a detailed and comprehensive analysis for global Optical Encoder for Robot market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Type 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 Optical Encoder for Robot market size and forecasts, in consumption value (\$ Million), sales quantity (K Units), and average selling prices (US\$/Unit), 2021-2032

Global Optical Encoder for Robot 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 Optical Encoder for Robot market size and forecasts, by Type and by Application, in consumption value (\$ Million), sales quantity (K Units), and average selling prices (US\$/Unit), 2021-2032

Global Optical Encoder for Robot market shares of main players, shipments in revenue (\$ Million), sales quantity (K Units), and ASP (US\$/Unit), 2021-2026

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 Optical Encoder for Robot

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 Optical Encoder for Robot 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 Heidenhain, Renishaw, Tamagawa

Seiki, Omron, SICK, FAULHABER, Rockwell Automation, Inovance, Broadcom, Nikon, etc.

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

Market Segmentation

Optical Encoder for Robot market is split by Type and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Type, 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 Type

Incremental Encoder

Absolute Encoder

Market segment by Structure

Open-Type

Sealed Type

Market segment by Motion Measurement

Rotary Encoders

Linear Encoders

Market segment by Application

Industrial Robot

Collaborative Robot

Service Robot

Major players covered

Heidenhain

Renishaw

Tamagawa Seiki

Omron

SICK

FAULHABER

Rockwell Automation

Inovance

Broadcom

Nikon

Maxon Motor

Baumer

RLS

HCFA

KingKong Technology

Yuheng Optics

POSITAL

Encoder Products Company

ZeroErr

K?bler

Dynapar Encoders

SIKO

Hengstler

Guangzhou Haozhi Industrial

Balluff

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 Optical Encoder for Robot product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Optical Encoder for Robot, with price, sales quantity, revenue, and global market share of Optical Encoder for Robot from

2021 to 2026.

Chapter 3, the Optical Encoder for Robot competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Optical Encoder for Robot 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 Type and by Application, with sales market share and growth rate by Type, 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 Optical Encoder for Robot market forecast, by regions, by Type, 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 Optical Encoder for Robot.

Chapter 14 and 15, to describe Optical Encoder for Robot sales channel, distributors, customers, research findings and conclusion.

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