

Global and China Industrial Robot Speed Reducer Industry Report, 2020-2026

Sept.2020

STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- ◆ To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- ◆ To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- ◆ To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- ◆ To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- ◆ To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications.

Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

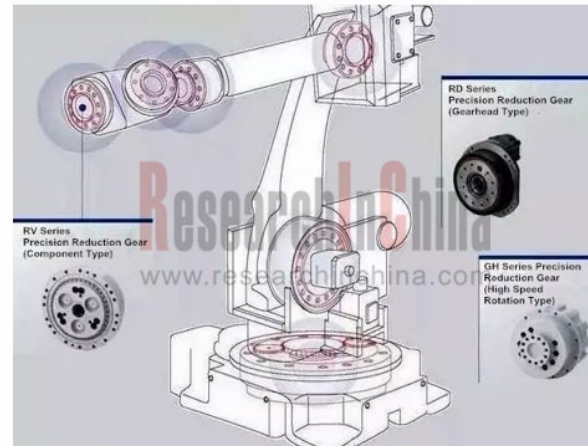
The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

Controller, servo motor and speed reducer, three core components of industrial robot, technologically determine key properties of an industrial robot, such as work accuracy, load, service life, stability and reliability. They constitute about 70% of industrial robot costs, of which speed reducer makes up 35%, servo motor 20% and controller 15%.

As an intermediate device connecting servo motor and actuator, speed reducer slows down an industrial robot by exporting power produced by servo motor in high speed rotation through the pinion on the input shaft that meshes with the gear wheel on the output shaft to deliver larger torque. Industrial robot requires extremely efficient reducers in the aspects such as precision, load and service life, which pose the highest technical barrier among these core components.

Use of Precision Speed Reducers in Industrial Robot

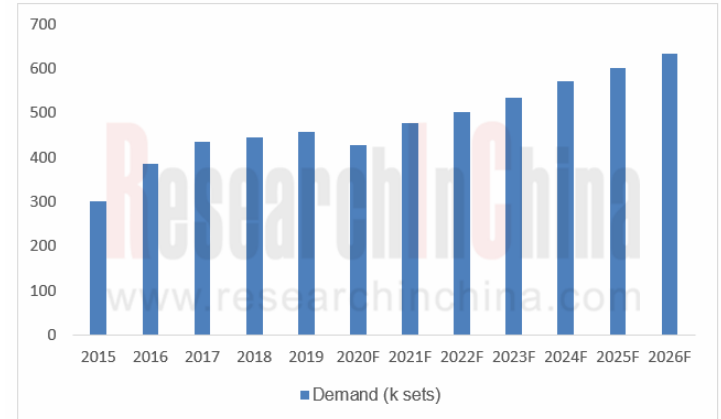


Source: Nabtesco

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Common speed reducers for industrial robots fall into harmonic and RV types. Harmonic reducer, a kind of single-stage gear reducer comprised of wave generator, flexible wheel and rigid wheel, works with the principle that wave generator uses flexible wheel to produce controllable elastic deformation and flexible wheel and rigid wheel are meshed to transmit power so as to reduce speed. Harmonic reducer with merits of high motion precision, large gear ratio, low weight, small size and low transmission inertia, is often used in light load scenarios, e.g., small load robots, or forearms, wrists or hands of large robots.

Industrial Robot Speed Reducer Demand in China, 2015-2026E



Source: ResearchInChina

Harmonic Reducer (Left) and RV Reducer (Right)



Source: elecfans.com

In general, a set of 6-axis multi-joint robot needs 4 sets of RV reducers and 2 sets of harmonic reducers; a set of SCARA robot contains 4 sets of harmonic reducers; a set of cartesian coordinate robot uses 3 sets of RV reducers and a set of harmonic reducer; DELTA robot whose motor is mounted on a fixed base packs a set of harmonic reducer. In 2019, a total of 151,000 industrial robots were sold in China, which demanded 457,000 speed reducers, 2.47% more than that in the previous year, of which 324,000 units were incremental demand and 133,000 units were stock replacement, as is showed from statistics.

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Precision reducer with a strict demanding on manufacturing links (material, equipment, process, etc.), is a market featuring high investment threshold, great technological challenges and ultrahigh entry barrier. As such, global industrial robot reducer market has long been monopolized by Japanese companies represented by Nabtesco and Harmonic Drive.

Nabtesco, a comprehensive machinery group in Japan, operates four business segments: Component Solutions (precision reduction gears, hydraulic machineries and new energy equipment), Transport Solutions, Accessibility Solutions and Other. Its precision reduction gears under its biggest segment are led by RV-N, RV-C and RV-E Series, well-known for high precision, high reliability and high stability. Nabtesco has two precision reduction gear manufacturing sites: one is Tsu Plant in Japan, and the other settles in Changzhou city of China, with a capacity of roughly 1.2 million units. In 2019, Nabtesco was reported to command approximately 58% of the global reducer market and bagged a staggering over 90% share in the segment of RV reducer for medium/heavy load industrial robots.

Harmonic Drive is one of the earliest specialists in research and development, design, production and sales of harmonic drive and special drive technologies around the globe, having been the world's biggest harmonic reducer supplier. Harmonic Drive focuses on developing, manufacturing and selling harmonic reducers which have found broad application in industries from robot, CNC machine tool, aerospace and printing machinery to medical device, measurement and analysis instrument and precision packaging machinery, sweeping virtually 50% of the global robot-use harmonic reducer market.

Chinese brands are late starters being left far behind their leading foreign peers in key parameters of products including service life, reliability, stability, noise and heat. In 2019, China-made reducers shared around 30% of the local market, while the remaining 70% went to foreign brands. In recent years, some Chinese competitors like Leader Harmonious Drive Systems Co., Ltd., Zhejiang Shuanghuan Driveline Co., Ltd. and Nantong Zhenkang Welding Electromachinery Co., Ltd. have achieved mass production and gained growing acceptance.

Leader Harmonious Drive Systems Co., Ltd. is a high-tech company devoted to developing, designing and manufacturing precision harmonic drive devices. It started research and development of precision harmonic reducers for robots from 2003, with product series including LCD, LCS, LCSG, LHD, LHS and LHSG. Its nearly 1,000 customers cover famous robot manufacturers in China like SIASUN Robot & Automation Co., Ltd., EFORT Intelligent Equipment Co., Ltd. and Shanghai STEP Electric Corporation. Its products have found their way into ABB's supply system, with annual capacity of 90,000 units. In 2020, the company launched an IPO with a plan to raise RMB630 million for "500,000 units/year Precision Harmonic Reducers Project".

Zhejiang Shuanghuan Driveline Co., Ltd, founded in 1980 and listed on Shenzhen Stock Exchange in September 2010, devoted itself to RV reducers from 2014 which have been developed into more than forty RV reducer models in three series, i.e., RV-C, RV-E, and RV-H. In March 2018, it signed an agreement with EFFORT Intelligent Equipment Co., Ltd about supply of speed reducers. At the end of 2019, the company lavished RMB312 million in the industrial robot RV reducer industrialization project in a bid the production capacity up to 60,000 sets of industrial robot RV reducer, and with a plan to build the annual capacity of 100,000 sets in 2020.

Nantong Zhenkang Welding Electromachinery Co., Ltd, established in 1993, began production of Zhenkang RV reducers in 2015 and became an early competitor in robot-used RV reducer field. It successfully developed the RV reducers for 300Kg-below robots, including 18 products in RV-E, RV-C and RD series. The company has boasted 300 robot manufacturers as its customers and has been selected by such Chinese robot producers as EFFORT, Kaierda, and Honyen Robot in their production. Nantong Zhenkang is capable of producing 30,000 sets annually.

The report highlights:

Industrial robot speed reducer industry (definition, classification, industry chain, technical trends, etc.);

Global and Chinese industrial robot market (size, structure and competitive landscape);

Global industrial robot speed reducer market (size, demand, companies' status quo);

Chinese industrial robot speed reducer market (demand, market segments, price trend, key companies, influencing factors, etc.);

5 global and 21 Chinese companies (operation, industrial robot speed reducer business).

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