

Precision Machinery & Robot

Main Products

- Hydraulic components for construction machinery
- Hydraulic components for agricultural machinery
- Hydraulic components and systems for industrial machinery
- Hydraulic steering gears for marine products
- Hydraulic deck machinery for marine products
- Industrial robots
- Medical and pharmaceutical robots

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Precision Machinery & Robot Company



Vision

The world's top brand in motion control, creating and providing total solutions for providers of medical and healthcare services as well as for industry, including automobiles, construction machinery, and electronic equipment, with a focus on hydraulic components and robots boasting a level of performance and quality far surpassing that of any rival.

Opportunities

- Hydraulic machinery**
 - Expanding demand due to world-wide infrastructure building, mainly in emerging countries
- Robots**
 - Increasing fields of application through the realization of humans and robots collaborating in work operations
 - Rising demand aimed at preventing infection, eliminating labor shortages, and improving quality
 - Progress in use of robots beyond industrial applications (such as medical treatment and nursing care)

Risks

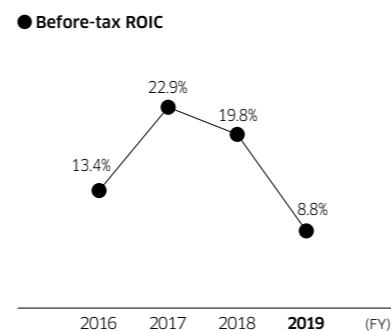
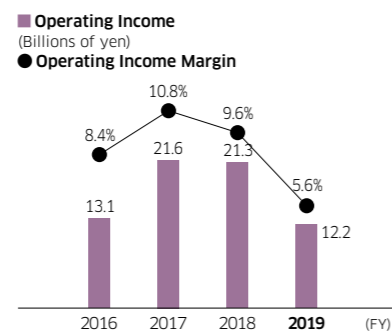
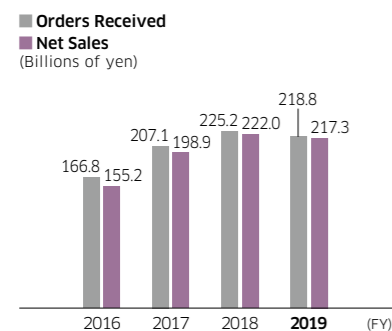
- Hydraulic machinery**
 - Shift to in-house production of hydraulic machinery by construction machinery manufacturers and market entry of manufacturers from emerging countries
 - Rapid cooling of the Chinese construction equipment market
 - Delayed recovery in the marine hydraulic equipment market due to sluggish conditions in the shipbuilding industry and intensifying price competition
- Robots**
 - Increasingly fierce price competition with rival companies
 - Impact of U.S.-China trade friction on the semiconductor market
- Shared**
 - Weakening investment appetite due to viral pandemic

Core Competence

- Hydraulic machinery**
 - Accumulated world-class, leading-edge technology, systemization capabilities, and brand power in the area of excavator hydraulic machinery
 - Ability to respond to customer requests
- Robots**
 - Ability to develop applications and make system proposals matched to diverse customer requirements
 - Global service structure
- Shared**
 - New product development capabilities in the field of motion control based on the integration of hydraulic technologies and robotics

Business Direction

- Hydraulic machinery**
 - Maintain and expand high share of excavator market, pursue sales expansion in construction and agricultural machinery sectors, and advance product and market development with an awareness of mega-trends
- Robots**
 - Existing customer sectors: Increase market share by expanding the scope of applications for the automotive industry, line building operations, and sales in the human-robot collaborative product field
 - New customer sectors: Integrate robotics with IoT/AI technologies to establish new businesses, develop products based on synergies with hydraulic technologies, expand sales of robotically assisted surgical devices, and launch and expand sales of automated PCR viral testing systems



Operating Environment and Strategies

Sales of hydraulic machinery for the construction equipment market are expected to steadily grow over the medium and long terms in line with growing infrastructure development, mainly in emerging countries, even though the COVID-19 pandemic has caused short-term market deterioration, mainly in developed countries.

Kawasaki is the leader of the global market for excavator-use hydraulic machinery. Going forward, we will maintain and expand our market share by leveraging world-class, leading-edge technology, the ability to turn such technology into systems, our brand strength, and responsiveness to customer needs. We will also actively explore promising new businesses, such as construction and agricultural machinery other than excavators, for which our market share overseas is relatively low, to realize further growth and improve stability in segment performance.

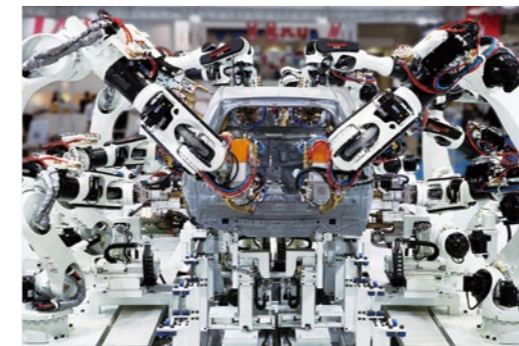
In the industrial robot business, although the COVID-19 pandemic has caused a decline in customers' appetite for capital investment, going forward, we expect demand to increase for robots that can be used to help prevent infection. Furthermore, over the medium and long terms, we expect demand in existing customer sectors to continue expanding to offset labor shortages and achieve higher quality. We also predict that robots will be used in a wider range of applications, including

in collaboration with humans in work operations as well as in medical treatment and nursing care.

In existing customer sectors, we will expand applications for automakers, create products for EV and HV manufacturing, expand line building operations, and expand sales of *duAro*, a robot designed to collaborate with humans in work operations. In addition, we will expand sales and market share by providing solutions that draw on the Group's experience accumulated through robot development for a wide range of applications within the Kawasaki Group and by enhancing the sales and service structure. In new customer sectors, we aim to establish new business fields by integrating robotics with IoT/AI, as with *Successor*,* expand sales of the robotically assisted surgical devices of Mediaroid, a joint venture with Sysmex Corporation, and commercialize automated PCR viral testing systems.

We will continue to pursue synergy by integrating hydraulic machinery and robot production and developing new products combining the technologies of each. By doing so, we will reinforce the businesses of the Precision Machinery & Robot Company as a whole.

* *Successor*: A technology system in which expert engineers use remote controls with kinesthetic feedback to safely operate robots and perform tasks. The robots memorize these movements, which they can then convey to the next generation of operators. Using AI to learn from recorded inputs, the system can also generate automated operational programs.



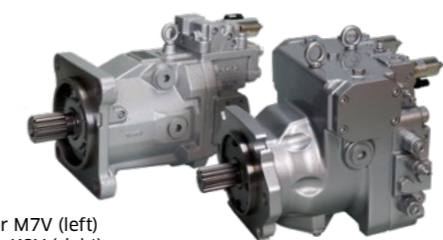
BX series spot welding robots for automobile body assembly lines



Hydraulic pump for construction machinery



hinotori™ Surgical Robot System



Hydraulic motor M7V (left)
Hydraulic pump K8V (right)

Initiatives to Create Social Value

Precision Machinery Business Division

The Precision Machinery Business Division has designated the following as its vision for 2030.

- Make Kawasaki hydraulic machinery and systems the global standard by expanding sales to customers around the world and achieve stable production and supply
- Support the development of next-generation of human- and environment-friendly construction machinery through Kawasaki products to contribute to the improvement of infrastructure, mainly in emerging countries
- Promote the development and sale of energy-saving products, hydrogen-oriented products and renewable energy-oriented products to contribute to the reduction of environmental burden
- Combine new technologies, such as ICT, IoT, and AI, with Kawasaki's robot technology and hydraulic control technology to create new value

To achieve this vision, we are working to establish systems for stable production and supply and advancing R&D into hydraulics systems aimed at creating ICT-linked, automated, and unmanned next-generation construction machinery for customers while advancing product development and sales in the pursuit of full-scale entry into agricultural machinery and industrial vehicle sectors. In addition, we are now mass-producing a high-pressure hydrogen regulator and advancing development toward secondary mass-production. Sales of Eco-Servo, an energy-saving, low-noise hydraulic hybrid system, have been strong, and we advancing the development of a compact electro-hydraulic actuator for humanoid robots, as well.



Goals for fiscal 2021	<ul style="list-style-type: none"> • Establish production sites and stable supply systems that are globally optimized in terms of cost, quality, and delivery time; advance development of technologies that will set our products apart in the future; and further expand sales in the hydraulic excavator, agricultural, industrial, and marine machinery fields in order to make Kawasaki products the global standard by supplying our hydraulic machinery and systems to customers around the world. • Establish firm foundations in new businesses, such as high-pressure hydrogen regulators for automobiles and fields based on synergies with the robot business • Hydraulic machinery production and delivery volume: 750,000 units
Fiscal 2019 Results	<ul style="list-style-type: none"> • Hydraulic machinery production and delivery volume: 700,000 units

Robot Business Division

The Robot Business Division has designated as its vision for 2030 improving access to high-quality medical care through the development of medical robots in developed countries facing demographic graying as well as using robot technology to support medical supplies production, nursing and medical care, and the development of therapies and treatments that reduce the physical burden on patients while developing and improving the intelligence of *Successor*, humanoid robots and other robots to help address labor shortages, mainly in developed countries. To achieve this vision, we have positioned medical robots as a business that will support aging societies and established

Medicaroid Corporation—a joint venture with Sysmex Corporation—through which we are working to create new business around robotically assisted surgical devices and applied robots using industrial robot technology. With regard to *Successor*, we have begun sales to specified customers and are developing a new market. We continue to advance the development of humanoid robots, aiming for commercialization.



Goals for fiscal 2021	<ul style="list-style-type: none"> • Increase our market share with existing automotive sector customers, reinforce proposition capabilities for line building solutions, expand sales channels for general production equipment in China, expand sales of robots for use in collaborative work with humans, and introduce robotically assisted surgical devices in the medical field • Promote the integration of IoT, AI, and robotics technologies and the development of products based on synergies with hydraulics technologies • Robots delivered: 40,000
Fiscal 2019 Results	<ul style="list-style-type: none"> • Robots delivered: 20,000