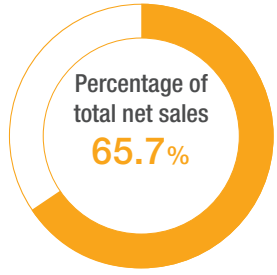
Transportation Systems Segment

Support railway transportation that connects people and cities with safety and trust, through manufacturing that merges electronics technologies and mechanical technologies in a highly advanced manner

Business Overview

Electrical equipment for rail vehicles manufactured by the Company using its technological capability developed over about a century covers a wide range of fields, including propulsion systems (drive systems), auxiliary power supply and door-closing units of trains, and we contribute to the maintenance and development of railway infrastructure overseas, not to mention in Japan, by pursuing safety and comfort of trains.

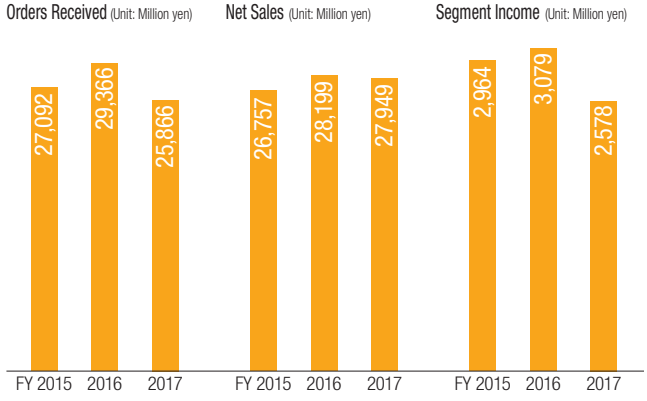


Results for fiscal 2017

Orders Received
25,866 million yen
(Down 11.9% year on year)
Orders received decreased 11.9% compared with the previous fiscal year to 25,866 million yen, due to a decrease in Japan despite an increase overseas (China).

Net Sales
27,949 million yen
(Down 0.9% year on year)
Net sales totaled 27,949 million yen, largely unchanged from the previous fiscal year, due to a decrease overseas (China) despite an increase in Japan.

Segment Income
2,578 million yen
(Down 16.2% year on year)
Segment income decreased 16.2% compared with the previous fiscal year to 2,578 million yen, due to the increase in costs of some overseas projects.



TOPICS

Establishment of a new Group company "Chengdu Yonggui Toyo Rolling Stock Equipment Co., Ltd." in China —20 years since launching business in China, we are starting a pantograph business

"Yonggui Toyo," the new company established in Chengdu, Sichuan Province in August 2017, finally began its operations. Yonggui Toyo mainly assembles and tests pantographs for urban transit railway vehicles, and will deliver to operators such as the Chengdu Metro. As the population of Chengdu is larger than that of Tokyo and more metro lines will be constructed going forward, business growth is expected.

To further strengthen our business in Chengdu, we made additional investments in Taiping Zhanyun, which previously was engaged mainly in the business of door engines, changed the company name to "Yangdian Zhanyun" and its structure to one that takes on the process of pantograph production. Through such efforts, we have set up the structure of assembly by Yonggui Toyo and components processing by Yangdian Zhanyun for our pantograph business in Chengdu.

Furthermore, Jingche Shuangyang acquired a new operating license, adding "product assembly" to the management scope on top of the maintenance operations conducted to date. At the end of 2017, technicians were dispatched from the Yokohama Plant to the local site and conducted training for pantograph assembly there.

As seen from the above, we are strengthening the cooperation between Group companies, and further expanding the business for urban transit railway vehicles in China.

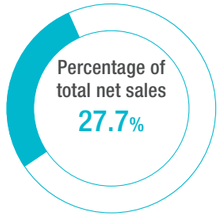
Training for pantograph assembly at Jingche Shuangyang

Industrial Systems Segment

Deliver technologies and gratitude to customers with highly precise, highly responding and highly efficient power electronics, for realization of an environment-friendly society

Business Overview

The Company is extensively contributing to customers at home and abroad through general industrial machinery and equipment, testing equipment for automobile development and social infrastructure equipment that is indispensable to the daily lives of people. In addition, we address manufacturing that contributes to the prevention of global warming, while providing products manufactured through high system-building technologies that make full use of energy-saving motors, inverters, FA controllers and networks.



Results for fiscal 2017

Orders Received
11,309 million yen
(Down 7.2% year on year)

Orders received decreased 7.2% compared with the previous fiscal year to 11,309 million yen, due to decreased orders for testing equipment and power sources, despite increased orders for electrical equipment such as processing equipment and printing machines.

Net Sales
11,769 million yen
(Up 6.3% year on year)

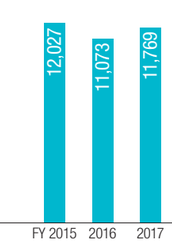
Net sales increased 6.3% year on year to 11,769 million yen, due to increased orders for power sources and electrical equipment such as processing equipment and printing machines.

Segment Income
276 million yen
(Down 63.0% year on year)

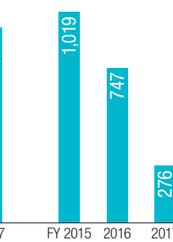
Segment income totaled 276 million yen, a 63.0% decrease compared with the previous fiscal year, due to the effects of a lower operating rate in line with the transfer to a new factory, and the greater weight of projects where the development element is large, such as testing equipment for automobile development.

Orders Received (Unit: Million yen)

Net Sales (Unit: Million yen)



Segment Income (Unit: Million yen)



TOPICS

New products being developed at the Shiga Ryuo Plant

We are developing new products at the new factory that began operations in June 2018.

Flat-type Dynamo

By evolving the dynamo into a flat-type model that is the same size as an actual tire, it can now fit inside the wheel well of the vehicle body. As a result, the possibilities of its applications are expanding, including in development test for autonomous cars where many sensors are used.

20,000 rpm Dynamo

The super-high-speed large-capacity dynamo, which has a rotary part that performs 20,000 rotations per minute, is applicable for development tests of electric vehicles.

Information Equipment Systems Segment

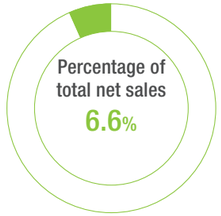
Provision of products that make the execution of operations on station premises and trains smooth and convenient and M2M solutions based on mobile phone networks and cloud servers using remote monitoring system

Business Overview

In the Information Equipment Systems segment, we operate in the two fields of railway station operating equipment and remote monitoring systems, by merging advanced telecommunication technologies and mechatronics.

With regard to railway station operating equipment systems, we develop and manufacture commuter pass issuing machines that quickly became IC card compliant and portable terminal devices for conductors, and provide systems for smooth toll collection and income management system to railway operators.

Our remote monitoring systems greatly contribute to labor saving and maintenance saving of customers through realization of various equipment monitoring and position monitoring, by leveraging cloud computing.



Results for fiscal 2017

Orders Received
2,416 million yen
(Up 35.1% year on year)

Orders received increased 35.1% compared with the previous fiscal year to 2,416 million yen, due to the receipt of a large-scale order for railway station operating equipment.

Net Sales
2,801 million yen
(Up 101.8% year on year)

Net sales increased 101.8% year on year to 2,801 million yen for a reason similar to that for increased orders received.

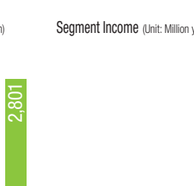
Segment Income
314 million yen
(Up 3.1% year on year)

Segment income increased 3.1% compared with the previous fiscal year to 314 million yen, owing to an increase in net sales, despite the effects of some projects where orders were received strategically.

Orders Received (Unit: Million yen)

Net Sales (Unit: Million yen)

Segment Income (Unit: Million yen)



TOPICS

Delivery of in-car supplementary ticket issuing machine for WEST JAPAN RAILWAY COMPANY

The Company delivered a total of some 2,700 in-car supplemental ticket issuing machines to West Japan Railway Techsia Co., Ltd. for use on the Shinkansen lines and existing railway lines of WEST JAPAN RAILWAY COMPANY. Compared with conventional machines, it can not only read but also write on transportation IC cards, it accepts payments by IC cards and credit cards (magnetic stripe) in addition to cash, and English can be printed on tickets for the convenience of foreign visitors.

The machine conforms to the security authorization standards of the Congress of Japan Railway Cybernetics.

We will continue to develop and provide easier-to-use railway station operating equipment.

Order received for consigned research and development of superconducting flywheel power storage system for railways

The Company received an order from East Japan Railway Company to conduct operations related to equipment manufacturing and the preparation of test reports for verification tests of a superconducting flywheel power storage system for railways.

Based on the "Basic Agreement on Technology Development of Superconducting Flywheel Power Storage System for Railways" concluded on March 29, 2018 between Yamanashi Prefecture, the Railway Technical Research Institute, and East Japan Railway Company, this system is being developed for the world's first practical use in the railway field. The Company will conduct the design and manufacturing of the power conversion equipment, and will be responsible for the overall coordination of this power storage system's construction, in cooperation with MIRAPRO Co., Ltd. (Hokuto, Yamanashi Prefecture; President & CEO: Hiroyuki Tsugane).

Through this business, the Company will work on the construction of a new power storage system that contributes to the improvement of energy efficiency, the stable usage of renewable energy and technology development in the railway field.

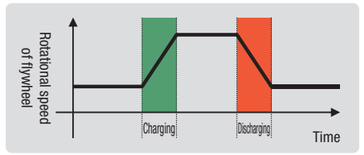
Superconducting Flywheel Power Storage System for Railways

The flywheel power storage system is a system that, by rotating a large disk (flywheel) within the device, stores regenerative electric power as kinetic energy (charging), and converts kinetic energy back to electric power (discharging) as necessary.

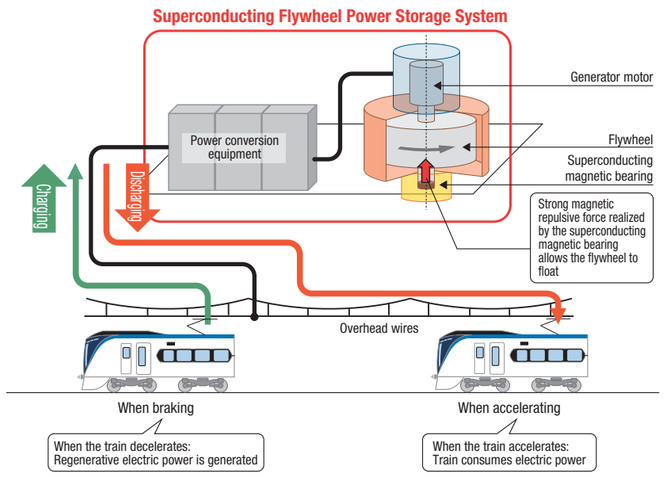
The bearing portion of the superconducting flywheel power storage system adopts the superconductivity technology designed by the Railway Technical Research Institute, and established through verification tests conducted in Komekurayama, Yamanashi Prefecture. The technology allows the flywheel to float, reducing rotational loss as there is no contact, and realizes a reduction in maintenance efforts.

When charging
Regenerative electric power of the train is absorbed, and flywheel accelerates

When discharging
Power is supplied to the train, and flywheel decelerates



Superconducting Flywheel Power Storage System



Announcement of new product IORemoterLTE: IoT terminal for Toyo IoT/M2M solutions/remote monitoring and control systems

The Company has announced IORemoterLTE, a new product that is an IoT terminal for remote monitoring and control systems, for Toyo IoT/M2M solutions.

The IORemoterLTE is a high-speed IoT terminal integrated in the LTE module. Through the use of the Toyo IoT/M2M solutions cloud service, the remote monitoring and control of various facilities, controllers, devices, and mobile entities can be conducted faster and at a larger capacity.

R&D to support the development of social infrastructure and supporting frameworks

Research and Development

The Group's R&D activities are based on seeking to create products that fully satisfy our customers and challenging the creation and expansion of these products, and we actively promote development of technologies of our existing businesses and basic technology developments that support this development as well as development of new products that expand our businesses.

Results and topics from fiscal 2017

Segment	Project	Description
Transportation Systems	Development of electric door-closing unit	Developed electric door-closing units that can be installed in existing spaces (the Company's air-operated door-closing units of type Y2, Y4, etc.), utilizing our many years of experience in the design and manufacturing of air-operated door-closing units.
	Right-angle cardan electrical equipment for super low floor type trains	Developed a self-ventilating main motor with the aim of reducing size and weight, as well as a drive unit with the aim of reducing noise and the burden of maintenance.
Industrial Systems	Development of 20,000 rpm and 350 Nm high-speed motor for automobile testing facilities	Developed a motor with a highest rotational speed of 20,000 rpm and a rated torque of 350 Nm, for use in testing facilities to test on-board motors for driving used in electric cars, hybrid cars, etc.
	Development of inverter compliant with 690 V power sources	Developed a 500 kW-class inverter unit compliant with 690 V power sources, for use at large-scale facilities overseas.
Information Equipment Systems	Development of IC-exclusive ticket issuing machine	Developing a ticket issuing machine that is IC-exclusive, as more operators choose not to use magnetic tickets and operate only with transportation IC cards.
Expansion of New Businesses	Function expansion of remote monitoring unit	Added the new functions of Wi-Fi compatibility, routing function within a FOMA-Ethernet, LTE compatibility, and the remote maintenance function to the IORemoter, an existing product, and launched it as IORemoterLTE.
	Reduction in size and weight from structural improvements in water-cooled inverter unit	To achieve further reductions in size and weight in the water-cooled inverter unit for on-board use, a main circuit structure that applies double-side cooling elements was designed, and it was confirmed that a 70% size reduction compared with conventional models is possible. Going forward, verification will be conducted through prototype manufacturing, and its application in small and light products will be promoted.
Research Laboratory	Development of main motor insulation system for overseas markets	Developed a motor insulation system that enables a reduction in man hours and the application of low-priced materials, with the purpose of reducing costs of main motors for rail vehicles overseas.
	Improvement in strength of vehicle cogwheels	Shot peening treatment for vehicle cogwheels is being considered, with the aim of increasing the strength, improving the reliability, extending the lifetime, and reducing the weight of vehicle cogwheels. It is confirmed that shot peening treatment increases strength, and final endurance tests are being conducted using testing equipment that simulates actual vehicle cogwheels in action with this treatment applied.

Intellectual Property

Our intellectual property is placed as a key corporate resource. Our intellectual property department is responsible for the management of intellectual property and our research laboratory and the development divisions in each business unit actively apply for patents and utility models.

In the overseas markets which we expect to further expand our businesses, we have started to actively engage in activities concerning our intellectual property in order to protect our technologies and brand.

Patent applications granted