

Percentage of net sales\*1

**44%**

\* 1: Total numerical value for the AC servo & controller business and the drives business of the Motion Control segment.

### Enhancing machine performance as major components incorporated in production equipment

#### Net Sales\*2

FY2016

**172,025** million yen

FY2017 (Plan)

**197,800** million yen  
(200,900 million yen)\*3

#### Operating Income\*2

FY2016

**22,772** million yen

FY2017 (Plan)

**34,200** million yen  
(34,700 million yen)\*3

\* 2: Total numerical value for the AC servo & controller business and the drives business of the Motion Control segment. The sales and profits for the PV inverter business previously included in Motion Control are included in System Engineering.

\* 3: The Company changes its accounting period starting fiscal 2017 from March 20 to the last day of February. Forecast figures in parenthesis are based on an assumption that the accounting period remains unchanged for the purpose of apples-to-apples comparison with the results of FY2016.

### Review of FY2016

In FY2016, the market environments were favorable for the AC servo business. FY2016 saw a change in demand trends, with orders that had conventionally peaked in the first quarter continuing to be received at high levels through the third quarter and peaking in the fourth quarter. The continued trend of high demand seen throughout the year had been to the backdrop of factors such as full-fledged investment in facilities related to the manufacturing of smartphones in China, the United States, and South Korea and increasing demand for semiconductors for use in IoT and for automobiles.

As one example, when we look at each part in the manufacturing of mobile devices such as smartphones, we see that Yaskawa's AC servos are used in the manufacturing

process at the majority of semiconductor and electronic component manufacturers. Machine equipment that process small items with high standards of precision are needed in the manufacturing of goods such as substrates, electronic components, liquid crystal panels, casing, and earphones, and these are areas where Yaskawa excels.

The technology for accurate processing is in demand for semiconductors, LEDs, and a broad range of areas in manufacturing.

The  $\Sigma$ -7 series, a mainstay line of Yaskawa's AC servos, offers both basic performance unrivalled by its competitors and usability, and it is extremely competitive because 90 percent of its production is automated. In China, where the cycle of equipment updates is rapid, sales of the  $\Sigma$ -7 series comprises 90 percent of the sales of Yaskawa's servo products, and the advantages of local manufacturing have been leveraged to greatly contribute to the increase of its market share and improved profit ratios.

Meanwhile, Yaskawa is coping with rapid increases in the number of orders received particularly in the latter half of the year with full production, and it is faced with the immediate need for expansions in its production capacity and increased productivity.

### Outlook for FY2017 and Initiatives for Achieving Mid-Term Business Plan

The market environments are such that demand related to the manufacturing of smartphones is expected to continue at high levels, at least through the first half of the year, and investment in key markets such as semiconductors, liquid crystal panels, and LEDs are also anticipated to continue their bold trend. Amid such conditions, Yaskawa will expand its market share and increase profit by firmly capturing growth markets and by boosting the switchover rates to its mainstay  $\Sigma$ -7 series on a global scale.

And amid demand for improvements in productiv-



**Akira Kumagae**

Corporate Vice President  
General Manager,  
Motion Control Div.

ity through the introduction of IoT and other measures, Yaskawa will not only stop at offering components; it will serve as a partner for its customers in resolving their issues by proposing automated solutions through multi-axis servos, controller-integrated servos, motors with built-in amplifiers, and combinations of robotics and AC drives for further differentiation of our business.

As for the manufacturing front, Yaskawa is in the process of constructing a new factory in Japan, aiming to start operations in FY2018. The purpose of this new plant is to demonstrate "Yaskawa Industrie 4.0" and is aimed to realize a BTO (Build to Order) production system that operates autonomously based on data linked by IoT. It will make it possible to check instantly the execution status for orders by visualizing through data the tasks that have been handled manually in the production of variable quantities of various models from procurement, production, and shipping to link all processes in a smooth manner. The primary purpose of this initiative is improved customer satisfaction attained through the 100 percent achievement of conformance to delivery periods promised to customers. Yaskawa believes that as a result, it will be able to achieve work efficiency as well as improvements in cash flow through reduced goods in process. It will simultaneously build a third factory in Shenyang, China, due to start



Machine controller MP3000 series

operations in 2018, as it plans to double its production capacity compared to FY2016 in China to monthly production outputs at the 200,000-unit level by the end of FY2018.

Through the above initiatives, Yaskawa will transform work styles during its mid-term business plan through FY2018 and bring about overwhelming improvements in productivity.

## A Strategy Aimed at Realizing Sustainable Growth

The world of manufacturing will continue to evolve more and more in the time to come. For example, demand forecasts leveraging AI will make it possible to project the types of goods that will sell in the future and obtain information on the types of areas in which investments will become active. The speed of change will become faster and faster, and it will be necessary to keep up with the changes. Amid such movements, Yaskawa will continue to pursue performance and quality for its servos and be the first to capture and implement in its products the various movements that come about in the world, such as the types of changes that occur in external environments—for example, the way in which the use of new materials will change devices— by aggressively leveraging AI for the process of manufacturing, as it continues to achieve sustainable growth.

## Business Risks and Countermeasures

- (1) Shortcomings in the strength to offer solutions to meet expanding needs for automation of systems
  - ➔ Strengthening of cooperative initiatives of the Yaskawa Group
- (2) The rise of emerging forces such as Chinese manufacturers
  - ➔ Differentiation of business by providing solutions
- (3) Sluggish activity in key markets
  - ➔ Expansions in areas where servos are applicable

## TOPICS

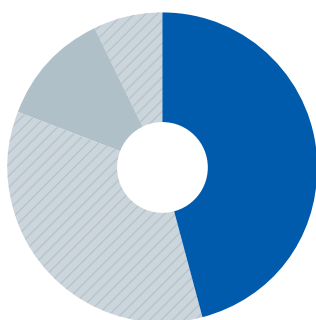
### Resolving Social Issues through its Business

$\Sigma$ -7 servo motors optimize magnetic circuits to improve motor efficiency and realize low heat generation. The dual axis servo pack  $\Sigma$ -7W uses regenerative energy between the axes to use the energy within devices in an efficient manner. The products and technology offered by Yaskawa's AC servo business division are used in a wide range of areas, from devices for manufactur-

ing semiconductors and liquid crystal displays, electronic component mounting devices, and machine tools to general industrial machinery. By offering such products, Yaskawa contributes to the environment-friendly manufacturing in industries which play a role in the development of an information society as represented by goods such as PCs, smartphones and 4K TVs.



AC servo  $\Sigma$ -7 series



Percentage of net sales\*1

**44%**

\* 1: Total numerical value for the AC servo & controller business and the drives business of the Motion Control segment.

**Contributing to energy-savings around the world through accurate motor control**

### Net Sales\*2

FY2016

**172,025 million yen**

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## Review of FY2016

The market environment in FY2016 was on a mild recovery trend after struggling with sluggish public investment in China and stagnant investments in the oil and gas markets in the United States in FY2015. Amid such conditions, Yaskawa worked on increasing its orders targeting “growing markets” and “strong markets” in each region, such as HVAC\* and agricultural use with a focus on pumps for irrigation equipment in the United States.

HVAC is the biggest global market for AC drives. Particularly in Japan, construction is underway for large buildings and other urban redevelopment ahead of the 2020 Tokyo

Olympics and increases in demand are expectable. Yaskawa has been able to obtain access to these redevelopment projects by leveraging the unique advantages of the matrix converter U1000 which allows measures for high harmonics and by matching communication standards for various automated buildings. The smaller sizes of the equipment, harmonic suppression, regenerative energy, and other comprehensive values for customers have been highly evaluated, and major growth has been enjoyed for U1000 with its orders quadrupling over the past fiscal year.

The GA700, the first in the new Zero Series lineup of AC drives, contains built-in sensors and other peripheral devices and offers new features like diagnoses of signs of abnormalities and links with cloud. It is for these reasons that instead of simply replacing conventional AC drives, Yaskawa suggests the new development of devices that leverage the new added values of the GA700 to its customers, which makes it possible to greatly reduce total costs as well as significantly reduce space for customer devices, reduce wiring, and reduce power. As switches will match the timing of new development, full performance results are expected to be produced after FY2017.

\* Heating, Ventilation, and Air Conditioning: Systems and technology for heating, ventilation, and air conditioning for buildings.

## Outlook for FY2017 and Initiatives for Achieving Mid-Term Business Plan

Yaskawa anticipates that global market conditions will improve in FY2017 due to steady investment in infrastructure and machinery exports in China and recovering oil prices. Particularly in Japan, it expects rising demand for steel material and cranes according to increased investment ahead of the Tokyo Olympics as well as energy saving regulations and harmonic regulations which will serve



**Nobuaki Jinnouchi**

Associate Director  
General Manager,  
Drives Div.

as tailwinds for its business.

Yaskawa will capture such a market environment as an opportunity and steer the rudder anew to maximize growth in each of the global areas. It will not stop at offering components in Japan but also serve as a partner for customers who resolves their issues with them, strengthening its supply of solutions that leverage the features of its new products to further boost differentiation.

For the Zero Series, it offers product lineups divided largely into two value lines: products for high performance transport and mobile applications such as cranes, elevators, and compressors, and products for simple hydro mechanical applications such as fans and pumps. Yaskawa will maximize orders by launching new products in these two value lines into global markets and offering optimum pricing for each market. It will also quickly deploy success cases for the GA700 which have been obtained through sales activities to date and at the same time accelerate sales by leveraging its global development structure to provide rapid responses to meet customer needs in each region.

As for the matrix converter U1000, as its harmonic sup-

pression features can make power generators smaller, the company will pursue and apply added value for its use in goods such as ships and crane vessels where generators are used.

Through these initiatives, Yaskawa will realize increases in sales and profit as it aims to achieve its mid-term business plan.

## A Strategy Aimed at Realizing Sustainable Growth

The two major roles for AC drives are that they are motor-driven and energy-saving. And for automation and environmental steps, the global trend will be such that areas where AC drives are actively used will definitely continue to exist. For that purpose, Yaskawa will continue to make aggressive efforts for technological innovation through such measures as the use of next-generation semiconductors such as SiC and GaN<sup>\*1</sup> for its drives business as a core business that serves as a foundation that supports the Yaskawa Group while boosting its value in a sustainable manner, embracing the key concept to “offer optimum value for all customer uses” as it realizes continued growth.

## Business Risks and Countermeasures

- (1) Foreign exchange risks from U.S. economic policy and BREXIT<sup>\*2</sup>
  - ➔ A balance through a five-global-point production
- (2) The rise of emerging forces such as Chinese manufacturers
  - ➔ Differentiation for business through the expanded provision of solutions

\* 1: Semiconductor materials  
SiC (Silicon Carbide), GaN (Gallium nitride)

\* 2: The United Kingdom's departure from the EU



AC Drive GA700

## TOPICS

## Resolving Social Issues through its Business

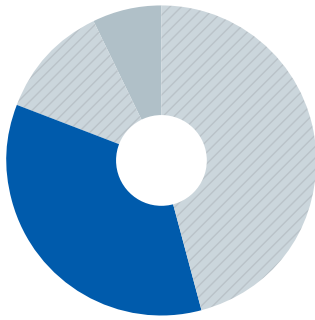
With the matrix converter U1000, it is easier to reuse regenerative energy that had conventionally been processed as heat in resistors. It is also used for many regenerative purposes including escalators where regenerative power occurs at all times and pump jacks (oil extraction machines) where operation and regeneration are always repeated. Its contribution for making machines,

facilities, and power sources smaller and more lightweight through harmonic suppression functions and less wiring will also reduce the energy required for transporting and setting up such items. Yaskawa's unique energy-saving solutions that enable the use of regenerative energy and harmonic suppression functions with a single unit also contributes in preventing global warming.



Matrix converter  
U1000

# Robotics



Percentage of net sales  
**35%**

Answering expanding automation needs of production sites to open up new opportunities of use

## Net Sales

FY2016

**139,993** million yen

FY2017 (Plan)

**156,500** million yen  
(160,000 million yen)\*

## Operating Income

FY2016

**10,253** million yen

FY2017 (Plan)

**14,600** million yen  
(15,300 million yen)\*

\* : The Company changes its accounting period starting fiscal 2017 from March 20 to the last day of February. Forecast figures in parenthesis are based on an assumption that the accounting period remains unchanged for the purpose of apples-to-apples comparison with the results of fiscal 2016.

## Review of FY2016

In addition to active investment in auto-related markets with a focus on China, FY2016 saw an increasing trend in demand for automation in general markets such as food, pharmaceutical, and cosmetics markets in Japan and abroad, as well as in the logistics market. Furthermore, due to the fact that semiconductor device manufacturers had been aggressive in capital investment, transitions in market conditions had been favorable. Amid such conditions, Yaskawa, with its awareness of the issue that increased market share in existing markets such as automobiles and increased sales in markets where growth had been expected, e.g. electronic devices and household appliances, were

not moving as expected, has been taking steps to prepare for its achievement of the targeted 10 percent operating profit ratio in its mid-term business plan.

One of such initiatives is the release of the new YRC 1000 controller and the GP series of small robots. In particular anticipation of deployments for the manufacturing lines for electronic devices such as smartphones and household appliances, Yaskawa is making overwhelming improvements in speed, resistance to the environment, and path accuracy. The company has also boosted its strength in offering painting systems globally through its investment in Doolim Robotics of South Korea. And in order to improve its responses to customer needs in Europe, it has decided to set up a new manufacturing base for robots in Slovenia. By building a structure for its robotics business locally that is equipped with development, manufacturing, and sales, it will bolster its relationship with customers through strengthened offers of products and solutions and aim for stronger competitiveness.

As a result of these initiatives, Yaskawa posted a record number of product deliveries on one hand, while posting decreased sales and profit against FY2015 on the negative effects of the strong yen on the other.



**Masahiro Ogawa**

Corporate Vice President  
General Manager,  
Robotics Div.



MOTOMAN-GP series △  
YRC1000 ▷



## Outlook for FY2017 and Initiatives for Achieving Mid-Term Business Plan

As to the market environment, Yaskawa expects further increases in demand for automation in the areas of electronic devices such as smartphones and household appliances. It foresees particular demand for the use of robotics for polishing and assembly, which involve high levels of technical difficulty and have significant impact on the value of products, and for precision work such as inspection and diagnosis. Yaskawa will aim for increased sales in these growth markets with the small robots launched last fiscal year.

As for automobile-related markets which comprise a large exposure of application markets for Yaskawa's robotics business at 60 to 70 percent, the company will further boost its offer of system solutions for arc welding, a strength of Yaskawa. Advancements in the areas of lighter, more rigid, and lower fuel consumption in line with the environmental regulations for automobiles are technical areas chiefly for major parts manufacturers called Tier 1. Through its offer of arc welding solutions with high added value to Tier 1 manufacturers, Yaskawa has been working together with these companies to resolve technical challenges. There are variances between areas where the company has much experience and those where it does not. Yaskawa will aim to further differentiate this business by working on technological innovation with customers globally, for example by deploying services for Tier 1 in regions where it has yet to develop a track record.

In various other industries besides automobiles as well, Yaskawa will strengthen its approaches on customers who will become the end users of its robots, share objectives, and work together to promote automation as it aims for increases in application areas for its robots and boosted sales channels.

Through these initiatives, Yaskawa will continue to aim to further boost its market share while realizing growth that exceeds market growth rates in looking toward achieving its mid-term business plan. The number of robot deliveries is expected to continue to increase, and based on that volume, Yaskawa will

continue to tie that in to steady improvements in quality as well.

## A Strategy Aimed at Realizing Sustainable Growth

Looking at things globally, while the mass production of goods tends to be becoming integrated in China, the manufacturing in the style of variable productions of multi-products appears to be remaining in advanced countries. Yaskawa will continue to contribute to automation for mass production as well as look for breakthrough technology for variable productions of multi-products where full automations are difficult. The key for that is the robot that works with humans. As the process of making things will be different in the manufacturing of variable productions of multi-products, to maintain productivity, robots are required to have high rates of flexibility to be able to move freely to locations where their skills are required. It is the foundation of Industrie 4.0 to advance digitalization at sites of where things are made and including the use of IoT and AI, and Yaskawa will continue to offer value to the world by realizing evolution at the production sites based on this concept.

## Business Risks and Countermeasures

- (1) Intensifying market competition in China
  - ➔ Further strengthening of solutions and vigorous launches of small robots for general markets
- (2) Impact of tariffs, etc. on export environment
  - ➔ Strengthening of global manufacturing structure with a focus on local production

### TOPICS

## Resolving Social Issues through its Business

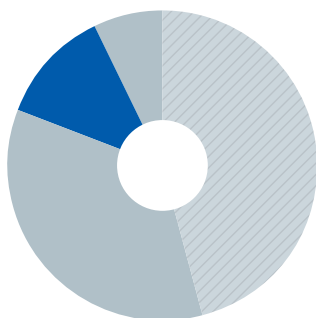
The MOTOMAN-HC10 robot that works with people can work alongside a person without the need to encircle it with a safety fence. Yaskawa will improve productivity at the sites of variable productions of multi-products where automation have been difficult due to the need to make changes in the layouts for the production process depending on production volume. Offering designs that give attention to safety, it has eliminated the possibility of people's hands and fingers getting caught. The

robot is also equipped with auto-stop features that take effect if and when external forces that exceed the restrictions set in advance are detected, allowing people and robots to work together in the same environment with safety. The robot is applicable for sites where the introduction of robots had previously been difficult and the company will thus contribute in resolving the issue of shortages of labor due to reasons such as declining birthrates and an aging population.



MOTOMAN-HC10

# System Engineering



Percentage of net sales

**15%**

Supporting prosperous life and society

## Net Sales\*1

FY2016

**59,354** million yen



FY2017 (Plan)

**54,400** million yen  
(62,800 million yen)\*2

## Operating Income (loss)\*1

FY2016

**-591** million yen



FY2017 (Plan)

**-1,100** million yen  
(-600 million yen)\*2

\* 1: The sales and profits for the PV inverter business previously included in Motion Control are included in System Engineering.

\* 2: The Company changes its accounting period starting fiscal 2017 from March 20 to the last day of February. Forecast figures in parenthesis are based on an assumption that the accounting period remains unchanged for the purpose of apples-to-apples comparison with the results of fiscal 2016.

## Review of FY2016

For steel plant systems, the company precisely captured needs for updating facilities, offered new technologies with high added value to its customers, and performed efficiently, which led to improved profitability. In the area of water and sewer systems, it also offered differentiation through proposals featuring AI and realized cost reductions.

Amid decreases in purchase prices for renewable energy in Europe, Yaskawa achieved continuous orders for mass production from its biggest customer MHI Vestas Offshore Wind A/S with highly competitive products that offer both reductions in costs and high quality in the area of large-scale wind turbines.

In September 2016, it acquired the development and manufacturing division for marine drive products of Wärtsilä Norway and boosted its product lineup for marine applications. Recognized for the performance to date of the Wärtsilä Norway, it received an order for the electric system for the first workboat in Japan for the construction of offshore wind turbines equipped with a large-scale crane.

## Outlook for FY2017 and Initiatives for Achieving Mid-Term Business Plan

Crude steel production by Japanese steelmakers is expected to hover steadily in FY2017 on the back of factors such as recovery in the area of automobiles. Steady transitions are expected for investments in water and sewer at unchanged levels from a year earlier. Amid such conditions, Yaskawa will precisely capture demand for updates in these existing businesses while aiming to secure stable revenue and strive for certain participation in new projects that will tie in to the next mid-term business plans.

As for the market for wind turbines, there are regions in Europe which are seeing grid parity below the power generation costs for fossil fuels and while there is impact from decreasing purchase prices for renewable energy, the development of new offshore wind turbines is expected to move forward with a focus on Europe. To meet needs for larger capacity in line with the bigger sizes of wind turbines, Yaskawa will also launch strategic products with the latest technologies to lead to orders for mass production.

As for the shipping business, it is said that updates will start for ships built a decade ago after 2020. And in view of the strengthening of emissions control for ships due to begin in 2020, switches are already underway for hybrid or electric propulsion ships, chiefly in China and Europe. Yaskawa will capture these market movements and initiate timely market-



**Hiroyuki Ougi**

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General Manager,  
System Engineering Div.

ing activities aimed for future business expansions.

In the area of solar-power generation\*, while the situation is such that there is unclarity as to the impact that the new U.S. administration will have on the market, Yaskawa is anticipating market expansion. It is amid such conditions that Yaskawa will enter a new product under development at Solectra Renewables, LLC. of the U.S. into the global market, chiefly the U.S. and Southeast Asia in FY2017. It will realize improvements in product quality and added value by switching products which are currently consigned for manufacture by OEM to internal production, along with new products for wind turbines.

Through these initiatives, the globalization of the system engineering business is further accelerating. Yaskawa will continue to make aggressive efforts to tie in growth in the global market for environmental energy to the growth of its business.

\* As of FY2017, the business related to PV inverters, which had been a part of the motion control segment until FY2016, has been transferred to the system engineering segment.

## A Strategy Aimed at Realizing Sustainable Growth

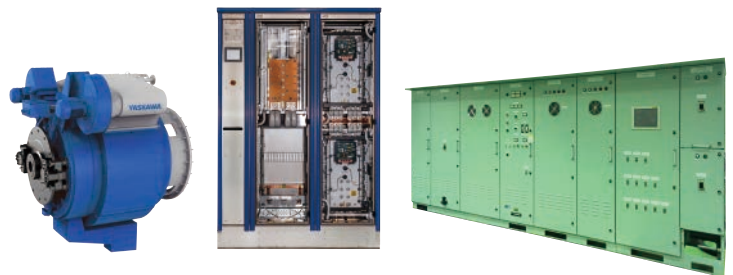
To date, the environment and energy business, which includes solar-power generation, large-scale wind turbines, and marine drives, has been expanding globally based on M&As. Yaskawa will tackle the standardization of core technologies in motors, generators, and converters, which will be the key for continuing to supply state-of-the-art products of high quality in looking toward further expansions in this business. It is also anticipating increasing needs for power storage solutions for realizing stable supplies of electricity and will aim to develop and realize new solutions in its next mid-term business plan by providing development support to a European venture in which it has invested.

## Business Risks and Countermeasures

- (1) Increasing demand for reduced prices for suppliers through lower purchasing prices for renewable energy in Europe
  - ➔ Cost reductions through product renewals
- (2) Intensifying competition over the prices of PV inverters for solar-power generation
  - ➔ Cost reductions through the launch of new products and differentiation through improved reliability



Generator and converter for large-scale wind turbines



Motor and converter for marine drive application

## TOPICS

## Resolving Social Issues through its Business

The use of renewable energy such as wind power and solar power is gaining more and more attention on the back of concern over an economy that relies on limited and depleting resources such as fossil fuels and moves to regulate greenhouse gas emissions. Particularly with wind power generation, rapid expansions are being seen globally for implementation and the market is expected to show further growth in the future. Yaskawa entered the market in 2010

with its launch of converters for large-scale wind turbines and has steadily produced results with deliveries of generators and converters for eight-MW wind turbines, the largest in the world. It will continue to develop products to meet increasing needs for large-capacity equipment and support activities to spread the use of renewable energy in all parts of the globe to contribute to the development of a sustainable society.

