

Servo Systems Division

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SANYO DENKI contributes to society by developing new products that help enhance the performance and quality of our customers' equipment and create new value. This article will introduce the features and innovative points of the servo systems products we developed in FY2020, and describe how they are contributing to our customers and society.

In particular, we will discuss wireless communication products for motion controllers and servo amplifier products.

For starters, we developed the *Wireless Adapter 3A*. This device adds wireless features to the *SANMOTION C S100* motion controller (hereinafter, *S100*). It makes it easy to wirelessly communicate using a wireless LAN or smartphone in a factory by simply mounting it to the USB connector of the *S100* motion controller and setting a few minimal

parameters. It also complies with the radio laws and regulations of many countries, so it can be used at various overseas production sites.

In recent years, IoT has been advancing at production sites with the aim of improving productivity and predictive maintenance of equipment. This product contributes to the advancement of IoT at production sites by making it easy to collect various types of data from machinery and servo control devices via wireless communication.

In the field of AC servo amplifier products, we enhanced our *SANMOTION R* 400 VAC input multi-axis servo amplifier lineup to support output capacities ranging from 20 kW to 37 kW. The new models are smaller and more lightweight, achieving a 61% reduction in volume and 60% reduction in mass compared to previous models. This was done by adopting a high-density component

layout and optimizing the heat dissipation design.

We have also developed an EtherCAT interface type control unit based on our *SANMOTION R 3E Model* servo amplifier. The control unit can help improve the performance and processing quality of machinery.

By combining these products with our previously developed 15 kW system, we were able to create a 400 VAC multi-axis servo amplifier lineup of products capable of driving motors with output capacities ranging from 550 W to 37 kW. As a result, we were able to complete a lineup that supports the same outputs as that of our 200 VAC multi-axis servo amplifier. This gives customers an even greater choice of products to meet their various machinery needs.

Below are overviews of the new products and their features.

■ Wireless Adapter 3A

In recent years, factory networks have been switching to wireless LANs to enable flexible changing of production lines to accommodate the diverse needs of consumers. Furthermore, the use of IoT in factories has been accelerating as a method for collecting and analyzing information from production sites with the aim of improving productivity and predictive maintenance of equipment.

Against this backdrop, we developed the *Wireless Adapter 3A* as a product that can add wireless communication features to the *S100* motion controller and be used at various production sites overseas.

The features of this product are as follows.

1. Easy network connection

This product can connect to a wireless LAN in a factory by simply mounting it to the USB connector of the *S100* motion controller and setting a few minimal parameters. Since it also comes with an access point mode that enables it to act as a master station, it allows wireless devices to connect to

each other even in areas where there is no available wireless network.

2. Compliance with regulations in various countries

This product complies with the IEEE802.11b/g/n wireless standard, allowing for faster and farther transmission. It can also be used at various overseas production sites, since it complies with the radio laws and regulations of many countries, including Japan, the United States, European nations, and China. This means that wireless equipment can be standardized without having to worry about replacing devices at each location.

3. Flexible modification of production lines

On production lines, various devices and equipment are wired together using cables to communicate information. When a production line changes, it can take a lot of time to perform the rewiring work. The use of this product eliminates the need to perform wiring, allowing for flexible changes to be

made to production lines.

4. Improved maintainability

It can sometime be difficult for operators to access machinery due to their installation location. This product facilitates maintainability even in these types of environments by enabling operators to diagnose machine failures and adjust servo systems from remote locations.

As described above, this product is a wireless device that makes it easy to connect machinery to a wireless LAN in a factory. It can contribute to the construction of flexible production lines and improve maintainability.



■ SANMOTION R 400 VAC Input Multi-axis Servo Amplifier (37 kW, 300/600 A)

In recent years, the expansion of industrial globalization has increased the need for servo systems with 400 VAC input specifications, primarily in European and Asian regions. In response to this demand, we released the *SANMOTION R* 400 VAC input multi-axis servo amplifier in 2018 as a product that can support output capacities up to 15 kW. Since its release, it has gained much popularity among customers.

More recently, we have expanded our lineup by developing a 400 VAC input multi-axis servo amplifier that can support output capacities up to 37 kW, as well as a new EtherCAT communication type control unit.

The features of these products are as follows.

1. Expanded lineup

We developed a 37 kW power supply unit as well as 300 A and 600 A servo amplifier units capable of driving servomotors with output capacities ranging from 20 kW to 37 kW. By combining these products with our previously developed 15 kW system, we were able to create a 400 VAC input multi-axis servo amplifier lineup of products capable of driving motors with extensive output capacities ranging

from 550 W to 37 kW.

As for control units, we released an EtherCAT interface type control unit based on our *SANMOTION R 3E Model*. This control unit can also be used with 200 VAC systems. This means that the host controller can be shared between 200 VAC and 400 VAC systems.

2. Downsizing and weight reduction

The products have achieved a smaller size by using the latest power modules and adopting an optimized thermal design and high-density component layout. They also use fewer components and achieve weight savings. In particular, the 600 A amplifier unit is much smaller and more lightweight, achieving a 61% reduction in volume and 60% reduction in mass compared to our previous model. Furthermore, we designed the structure of the heat sink to suppress component temperature change and increase product reliability, while also achieving a smaller size.

3. Increased control unit performance

The new EtherCAT control unit has better servo response and suppresses

machine resonance and vibration better than previous products. It also comes with functions for monitoring the status of power consumption and communication quality and for estimating the remaining life of dynamic brake (DB) relays and holding brakes. These capabilities and features contribute to improving machinery productivity and processing quality and can also be used to perform various diagnostics and preventive maintenance.

Details on these new products are provided in the New Product Introduction section of this Technical Report.



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Works on the design and development
of servo amplifiers.