

SANMOTION Products

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We at the SANYO DENKI Group aim to create new value and address social issues by developing and providing products and services that have never been seen before. In line with the increasing awareness of the SDGs in recent years, we have been developing new products that enhance the performance, quality, and reliability of our customers' equipment while also considering societal and environmental impacts.

This article presents the SANMOTION products developed in 2023.

Firstly, we have added a new power regeneration model to the lineup of the *SANMOTION R* power supply units. This model feeds the regenerative power generated during servo motor deceleration back to the power grid.

When a motor decelerates, it acts as a generator and produces regenerative power. Through this technology, the unit efficiently

feeds the energy back to the power grid, reducing power consumption in equipment and factories. In addition, it accurately measures the current and voltage of the converter, allowing users to check the amounts of power consumed by their servo system and saved by reusing it.

The product contributes to making equipment more energy-saving with its power regeneration technology and power condition visualization.

Next, we developed the *SANMOTION C S200* motion controller with technology for managing equipment operation featuring functions for equipment status monitoring and troubleshooting.

This product can remotely monitor equipment conditions and send production status notifications by email, enabling maintenance from any location.

It also records servo system

information and camera images on memory cards over long periods, enabling users to check equipment operating conditions and quickly address errors for reduced downtime.

To sum up, the power regeneration model of the *SANMOTION R* power supply unit contributes to reducing customer power consumption and preserving the global environment through the use of power regeneration technology and energy-saving useful functions.

The motion controller uses email notifications, remote monitoring, and image recording to improve equipment productivity and contribute sustainable production.

Below are some of the features of these new products and their contribution to customers and society.

■ The *SANMOTION R* power supply unit, power regeneration model

Recently, efforts have been underway toward the realization of an eco-friendly, sustainable society through the effective use of renewable energy and further energy savings.

In this context, servo systems are required to use energy more efficiently and contribute further to energy savings.

To meet these expectations, we have added a newly developed power regeneration model to the lineup of the *SANMOTION R* power supply units, which feeds the servo motor's regenerative power back to the power grid. Its features are as follows.

1. Reuse of regenerative power

When equipment decelerates, the servo motor acts as a generator and produces regenerative power. Our current regenerative resistor model, with its resistor, consumes the regenerative power as heat. The existing power supply unit lineup has been expanded with the addition of the new power regeneration model, which feeds the regenerative power back to the power grid for reuse.

The new model enables the regenerative power to be reused to power other equipment, reducing the total power consumption of a factory.

2. Power supply and power consumption monitoring

The voltage, current, frequency, and power consumption during the new model's power running and regeneration can be checked via an EtherCAT-connected controller.

The function helps users reduce electricity costs by enabling them to review the operating conditions and manage the power consumption of their entire factory based on this information. Such detailed operational data helps review the operating conditions of equipment and manage factory power consumption, reducing electricity costs.

3. Remaining component life estimation

The product estimates the remaining lifespan of regular replacement parts, enabling users to plan a replacement for components such as the main circuit electrolytic capacitor and cooling fan. This helps planned maintenance

such as inspections, repairs, and parts replacements, ensuring the productivity of production lines.

Additionally, a drive recorder logs the power regeneration model's operating conditions, power supply status, and load conditions as waveforms, helping identify changes and alarm causes to reduce recovery time.

In this way, the power regeneration model added to the *SANMOTION R* power supply unit lineup facilitates energy management for customer equipment and entire factories, contributing to reduced electricity costs and environmental preservation.

Details on this product are covered in a separate article in this issue.



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■ The *SANMOTION C S200* Motion Controller

In recent years, IoT technologies have been increasingly used in various industries to improve production productivity and quality. To ensure efficient, stable production, motion controllers must detect changes in the operating conditions and the ambient environment of equipment to promptly respond to these changes. There is also a demand to collect and record equipment data in real time to quickly resume operations in the event of a shutdown.

Accordingly, we developed the *SANMOTION C S200* motion controller, which accurately monitors equipment operating conditions for easy maintenance. Its features are as follows.

1. Real-time monitoring of equipment conditions

This controller features SMTP protocol-based email notification to promptly inform the administrator when equipment errors are detected. It can also send notification emails regarding production information such as when the planned production volume is reached. This enables users to quickly

understand the equipment status and production conditions, helping maintain stable, efficient production.

2. Remote monitoring and maintenance

Remote monitoring of the operating conditions, including axis positions and error information, has been achieved by connecting the device to Automation Server⁽¹⁾ and using the web-based data visualization.⁽²⁾ Furthermore, users can test and modify programs by connecting to a VPN⁽³⁾. This function enables equipment to be maintained from any location at any time, reducing the time required for maintenance and inspection.

3. Quick root cause analysis

The new controller can collect and record time-series data on connected servo systems, digital input/output signals, and environmental conditions such as temperature and humidity. It can store the collected data in its built-in storage or a microSD card, enabling users to check equipment operating conditions over long periods of time. The new controller can also record the

equipment status as an image when connected to a webcam. For example, when an error occurs, the new product records images before and after the error, enabling prompt identification of the root cause.

In this way, the motion controller is designed to detect changes in the operating conditions and ambient environment of the equipment, promptly notifying users of the status. If an error occurs, users can analyze the recorded data to promptly identify the cause, reducing the time needed to restore normal operational status.

Furthermore, it contributes to improving the productivity of equipment by enabling users to remotely monitor the operating status of equipment and perform maintenance when necessary.



(1) The name of the cloud service provided by CODESYS for remotely operating controllers.

(2) A drawing tool feature for designing screens on a web browser.

(3) VPN, or Virtual Private Network, is a technology for connecting locations with dedicated virtual lines and securely exchanging information.

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