

Servo Systems Division

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This document summarizes the main product developments Servo Systems Division has engaged in through 2010.

We developed "SANMOTION F2"-series stepping motor with International Protection code IP65, degrees of protection provided by enclosures (IP Code), for use in industrial machinery with high waterproof and dustproof

performance.

We developed a servo motor as an expansion of the popular "SANMOTION R" Series product lineup, the "SANMOTION R" Series 180 mm square servo motor.

For the "SANMOTION Model No. PB", we developed the "SANMOTION Model No. PB" Series EtherCAT specification 2 axes in 1 driver, which can handle EtherCAT

communications, one of the high-speed interfaces that is gaining attention in the industry.

For controllers, we enhanced our product lineup with the popular "SANMOTION C" Series controller peripherals.

The following paragraphs provide the overview and features of each product.

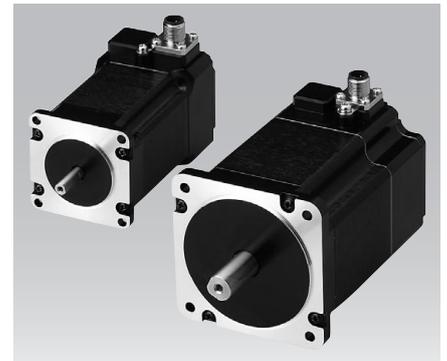
■ "SANMOTION F2" Series, International Protection Code IP65, Stepping Motor

Stepping motors are used in a wide variety of applications due to their ease of control. Conventionally, stepping motors were often applied in the field of office automation, but in recent years, applications in the field of factory automation have increased. This time, we developed a stepping motor with high waterproof and dustproof capabilities that match the requests from these fields and also has multiple options that can be selected.

The new model lineup consists of a 56 mm sq. and 86 mm sq. flange models, both are 2-phase stepping motors with AC 250 V-specifications.

The new model has the following features:

- The motor construction is designed with high waterproof and dustproof capabilities to achieve International Protection code IP65.
- Parts and the construction were designed to be common to correspond to various specification demands, such as for the lead wire outlets.
- In response to requests from the factory automation field, various optional add-ons are available, including brakes, encoders, and oil seals.
- UL standards and EC Directive-compliant (CE-marked).



■ “SANMOTION R” Series 180 mm Square AC Servo Motor

There have been a growing number of requests for improved manufacturing efficiency for industrial machines such as injection molding machines and industrial robots. As a result, we have received many requests for improvements to the servo motors used in these industrial machines, such as improvements to maximum rotational velocity or improvements to maximum instantaneous output torque. To respond to these requests, we enhanced our product lineup of "SANMOTION R"-series AC servo motors which is earning a good reputation and developed a 180 mm square servo motor often used in injection molding machines.

The new model has the following features:

- New model lineup includes the following 5 models: 180 mm square 3.5 kW, 4.5 kW, 5.5 kW, 7.5 kW, and 11 kW models.
- Maximum rotational velocity is 1.3 times compared to the conventional model at a maximum ratio, and applicable to high-velocity operation.
- Cogging torque has been reduced by 50% compared with the conventional model by optimizing the magnetic circuit.
- Can correspond to customer demands for rapid acceleration and deceleration with a maximum instantaneous output torque that is 1.2 times compared to the conventional model at a maximum ratio.

- As optional support, the structure can include a removable encoder for improved maintainability for the customer.



■ “SANMOTION Model No. PB” Series EtherCAT Specification 2 Axes in 1 Driver

As a response to requests for improved performance in industrial machines, high-speed networks based on industrial Ethernet are growing rapidly. SANYO DENKI was among the first to develop the “SANMOTION R” Series ADVANCED MODEL with EtherCAT interface in 2009, which became popular in the market. These requests for high-speed networks are not limited to AC servo systems, but are also increasing among stepping systems. In particular, there are strong requests from semiconductor manufacturing equipment manufacturers.

SANYO DENKI developed 2 axes in 1 driver with EtherCAT interface based on the “SANMOTION Model No. PB” Series stepping motor in response to these requests.

The new model includes the following features.

- By achieving 2 axes in 1 driver, the cost burden for the interface is distributed to enhance improved cost performance.
- Both absolute and incremental encoders are applicable to correspond to various applications.
- Can correspond to applications

needing synchronous operation, by newly enabling command synchronization between controller and driver.



■ “SANMOTION C” Series Controller Peripherals

The “SANMOTION C” Series controller is earning a good reputation in the market as a product that integrates the functions of the PLC (sequence controller), the motion controller, and the robot controller.

In order to respond to requests for high-speed networks, Sanyo Denki then developed the “SANMOTION C” Series controller for high-speed interfaces, getting great feedback from customers.

The “SANMOTION C” controller can support many types of applications, but many of these applications require a great number of input and output points. Furthermore, in the field of industrial robots, there were many requests for even smaller teaching pendants. In order to respond to these requests, we developed a module that

can handle more than 16 input and output points and a smaller teaching pendant.

The model has the following features:

- We developed a 32-point input module and a 32-point output module. The output module lineup has been enhanced with both sink output and source output.
- The teaching pendant have been downsized to approximately 80% and reduced in weight to 65% compared to the conventional model, greatly reducing robot operator’s burden.
- Addition of 32-point input and output module to the product lineup can save customer’s control cabinet space by half compared to the conventional model.



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Joined Sanyo Denki in 1983.

Servo Systems Division

Worked on the design and development of servo systems.