Servo Systems Division

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This document summarizes the main product developments for the Servo Systems Division in 2006.

The "SANMOTION R" series small capacity servo motor was developed to provide 30 W to 750 W. The "SANMOTION R" series servo amplifier with built-in CANopen interface was developed to handle CANopen networks that are rapidly spreading throughout the European market.

A 28 mm sq. stepping motor was developed to achieve higher torque than the conventional model, while a miniature driver mounted on a printed-circuit board was developed to combine with this motor.

The following information provides an overview and features for each product.

■ "SANMOTION R" series small capacity AC servo motor

With environmental issues and energy problems in recent years, demands have increased for high efficiency and resource saving motors.

Furthermore, as industrial equipment such as industrial robots, semiconductor manufacturing equipment, or electronic parts assembly equipment continue to sophisticate, the market has begun making strict demands for improved performance, including smaller size, lighter weight, increased torque, faster rotations, and lower cogging torque. There are many common areas between the environmental issues and market demands. With smaller control devices, the overall equipment can be made more light-weight, thus contributing to environmental conservation by reducing the amount of consumption energy during operations. At the same time, advanced measures to suppress heat generation are indispensable prerequisites reducing the size of control devices. The "SANMOTION R" series small capacity AC servo motor was developed to meet all of these market demands and with these technical issues in mind.

The "SANMOTION R" series has a substantially shorter motor length compared the conventional Sanyo Denki product to realize one of the smallest and lightest weight products in its industry class. Compared to the conventional product, the total length is 29% to 38% shorter and the weight for all models is at least 20% less. Furthermore, the occupancy ratio of the motor winding was increased to achieve a 15% to 40% reduction in loss.

The output also achieves a wide range. While the fastest rotation speed for conventional products is 4500 min^{-1} or 5000 min^{-1}, the fastest rotation speed for the "SANMOTION R" series is 6000 min^{-1}. The instantaneous maximum torque was also increased 15% to 26% compared to conventional product.

The "SANMOTION R" series lineup uses 200 VAC power supply standard. There are three types of flange sizes (40 mm, 60 mm, or 80 mm) and six types of rated outputs (30 W, 50 W, 100 W, 200 W, 400 W, or 750 W) for a total of seven models.

■ “SANMOTION R” series servo amplifier with built-in CANopen interface

Recently, the use of open networks has been rapidly spreading through the industry.

There are many types of open networks competing especially in Europe. Among the competition, the CANopen interface holds a large number of shares and likely will continue to be in high demand. Furthermore, 3-phase 4 wire 380 to 480 VAC is standard abroad, so there is high demand for servo amplifiers that meet this power supply.

With this in mind, we developed a servo amplifier with a built-in CANopen interface to target the European market. The lineup includes single phase 230 VAC input type for small capacity motors and 3-phase 400 VAC input type for mid to large capacity motors. The single phase 230 VAC input type contains only the CANopen interface and is built to the same height and depth of standard interface products that are currently sold in Europe so that customers can smoothly replace the products. The 3-phase 400 VAC input type contains both standard and CANopen interfaces to win over new potential customers in Europe.

The “SANMOTION R” series includes the following lineup:

Single phase 230 VAC input type
15 A, 30 A, 50 A
Combination servo motors:
30 W to 1.5 kW

3-phase 400 VAC input type
25 A, 50 A, 100 A
Combination servo motors:
0.5 kW to 7 kW

■ “SANMOTION F” series 28 mm sq. stepping motor

As the optimal motor for equipment that demands small size and space-saving design, our company has redesigned our smallest high torque stepping motors: the 2-phase, 28 mm sq. type and the 5-phase, 28 mm sq. type.

These stepping motors have the following features.

- The torque is greatly improved over the conventional model, leading to the highest torque in the industry for stepping motors of the same size.
- The design was optimized to meet demands for low noise.
- The stepping motors include two methods for wiring in order to meet a wide variety of demands in the market: lead wire type and connector type.
- The stepping motor was redesigned to meet the environmental demands of the RoHS directive. Due to these changes, this product has been recognized as ECO PRODUCTS.

This product lineup features two types of motor lengths each (32 L, 51.5 L) for the 2-phase and 5-phase types.

■ "SANMOTION F" series small-size 5-phase driver

The 2-phase stepping motor has been used in a wide variety of equipment from OA devices to general industrial machinery as an easy-to-use actuator with open loop. However, there are an increasing number of cases where switching to a 5-phase stepping motor has been examined in order to lower noise and improve precision. Particularly when dealing with miniature devices, market demands are increasing for an IC driver for driving motors that is mounted to the PCB in that device. We developed this product as a driver for mounting to a PCB to meet these market demands.

The driver has the following features.

- The entire product is covered in a plastic cover to prevent foreign matter from getting inside and to protect the internal electronic parts.
- In order to check the driver settings and driver status, the switch was installed on top of the cover with a 5 digits, 7 segment LED for status display.
- Combinations can be made with the following types of 5-phase motors: 28 mm sq., 42 mm sq., 50 mm sq., and 60 mm sq.
- It includes self-running mode to perform simple checking of operations and low loss mode to suppress heat from the driver.

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Joined Sanyo Denki in 1983.
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Worked on the design and development of servo systems.