

# Servo Systems Division

Shigejirou Miyata

The main technological results of the servo systems division in 2003 are as follows:

1. An incremental sensor "SANMOTION RP095," which adopted the resolver method, is developed as a sensor for a special environmental usage.
2. Synchronous motors for the UL and CE standards are added as the "SANMOTION" M series.
3. The 300A is added to the AC servo amplifier "SANMOTION" Q series S type.
4. A serial interface (RS485) type in which the positioning function is built was newly developed for the driver for the servo amplifier stepping motor for a specific customer.
5. The DC24V input servo amplifier for small size, lightweight, and low voltage input is added to the "SANMOTION" Q series S type as an actuator system, which is installed in a semiconductor manufacturing apparatus or a robot, etc.
6. The 2 phase 35mm sq. 1.8°/Step stepping motor suitable for a small size and lightweight device was developed.

A new product, which gives priority to ease of use, and an expansion of the safety standard acquisition, and a new product of which reliability in a special environment has been improved have joined the conventional product line, all of which gives us the expectation for expansion of the market and usage.

The following text will explain each product's features.

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## Resolver Method Incremental Sensor "SANMOTION Model RP095"

The incremental sensor "RP095," which uses the resolver method, was developed as a sensor for special situations in which an optical sensor was not usable because of vibration and temperature problems. The resolver method is durable and highly reliable, and is therefore able to be long-term maintenance free.

Because "RP095" outputs an incremental pulse of A, B, and Z phases, it is possible to receive with a widely-used counter circuit, and it

also can be applied as is to conventional systems which previously used an incremental sensor. It has also the function to output CS signals in the wiring saving mode just like our incremental sensor.

Incremental sensor "RP095," can be sold as a stand-alone product independent of the servo motor, and used as a position sensor in certain situations.



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## Synchronous Motor for UL and CE standards, "SANMOTION" M series

The product that complies with the UL and the CE standard was completed as the "SANMOTION" M series for the sales reinforcement in foreign countries, and added to the synchronous motor, which enables complete synchronous, low-speed rotation, and low vibration due to the gearless direct drive of the multi-pole motor.

Specifically, the newly developed 3 phase motor achieved even lower vibration than the single phase. Moreover, phase shifters are not necessary since direct drive by the 3

phase power supply is possible.

The following are newly added models:

- 56mm sq. size: single phase 120V type 8 models, single phase 240V type 4 models
- $\phi$  86mm size: single phase 120V type 6 models, single phase 240V type 6 models, 3 phase 240V type 6 models
- $\phi$  106mm size: single phase 120V type 6 models, single phase 240V type 6 models, 3 phase 240V type 6 models



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## 300A Was Added to AC Servo Amplifier “SANMOTION” Q Series S Type

The 300A was added to the “SANMOTION” Q series S type servo amplifier, which has a lineup of up to 150A.

The basic performance is equivalent to the products of below 150A and the loss, as a servo amplifier became 70% to the conventional model “SANMOTION” PY.

This reduction of loss reduced the size of the servo amplifier down to approximately 60% of the conventional “SANMOTION” PY, which can contribute to miniaturization of the customers’ control boards.



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## Serial I/F Servo Stepping System Product

We developed a servo stepping system product that uses RS485 communication for a specific customer while the demand for serial communications of I/F between controller drive devices that aimed on the total cost reduction of the device and the maintenance improvement rose.

The driver for the stepping motor realized 50% of miniaturization to our conventional model as a double axial unit type by using the latest

hardware.

In addition, the servo amplifier developed for another device has the positioning function installed and contributed to reducing the processing load of the customers’ controllers.

This product can be considered a great contribution to miniaturization of the device and customers’ reduction of the device and development load.



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## “SANMOTION” Q Series DC24V Servo Amplifier

There is a demand for a servo system that accommodates small size, lightweight, and low voltage input, as an actuator system to mount on a semiconductor manufacturing device or robot. To meet this, the DC24V input servo amplifier was added to the “SANMOTION” Q series S type servo amplifier.

The basic performance is equivalent to the “SANMOTION” Q series and both analog/pulse train I/F are equipped.

The motor and sensor are adapted to 50W and 80W wiring saving incremental encoder and absolute encoder. The size is reduced by 50% to the AC input “SANMOTION” Q amplifier 15A product.

This product can be considered a contribution to miniaturization and lightweighting of customer devices.



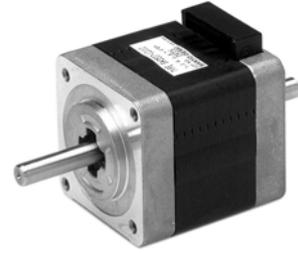
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## Development of “SANMOTION” Stepping System 2 Phase 35mm sq. 1.8°

We have recently developed a “SANMOTION” stepping system 2 phase 35mm sq. 1.8°, which is suitable for miniaturization and lightweight devices. Three types motor sizes, 33mm, 37mm, and 52mm, are now offered as middle range sizes together with the conventional 28mm sq. size and 42mm sq. size.

This new model corresponds to our unipolar driver, as it has suitable wiring for this driver (as a 1.2A/phase specification product), and is the latest addition our unipolar volume line.

This product lineup further enhances the wide variety of choices of suitable stepping motors for our customers' needs.



### **Shigejiro Miyata**

Joined company in 1978.  
Servo Systems Division  
Worked on the development, design,  
production and quality control of  
servo systems.