Servo Systems Division

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This report summarizes major Servo Systems Division-developed products in 2011.

The followings are the products developed in 2011.

- "SANMOTION F2 14 mm-square 2-phase stepping motor," the smallest and lightest stepping motor in the industry (please refer to Note 1.)
- "SANMOTION F5 micro-step driving 5-phase stepping driver, " significantly reducing the vibration compared to the conventional one
- "SANMOTION F3 SSCNET Ⅲ -compliant 3-phase DC power supply stepping driver" conforming to SSCNET Ⅲ -communication, one of high-speed network
- "HA062," a maintenance-free batteryless absolute encoder

The followings describe the overview and features for each product.

■ "SANMOTION F2" -series model, 14 mm-square 2-phase stepping motor

Stepping motors are used in a wide variety of applications because of their ease of control. The demand for small-sized actuator has been increasing because of downsizing and transition from pneumatic control to electrically-driven control in the industry. In response to the demand, we developed "SANMOTION F2" -series model 14 mm-square 2-phase stepping motor.

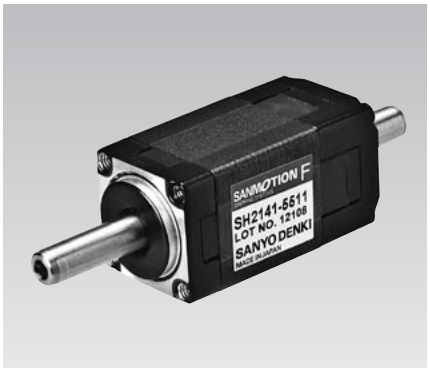
This model features as follows:

This motor is the smallest and lightest in the industry with the following technologies.

Optimization of the motor stator core and motor rotor core

Shift from the conventional insulating system adopting resin material to the one adopting coating material

We also newly offer a dual-shaft motor to enable encoder to be installed.



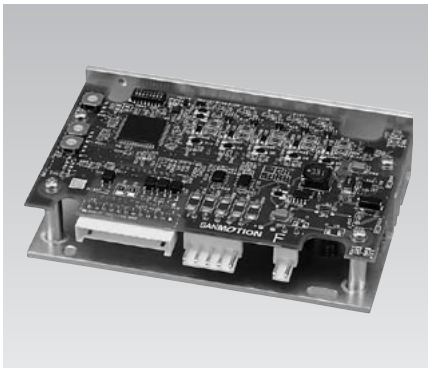
■ “SANMOTION F5” -series model micro-step driving 5-phase stepping driver

Stepping motors are widely used as actuators for semiconductor manufacturing equipment, office automation equipment, and food machinery, with their reasonable system costs. On that basis, the market requires further vibration reduction for actuator. In response to the demand, SANYO DENKI developed “SANMOTION F5” -series model micro-step driving 5-phase stepping driver.

This model features as follows:

Downsizing and weight saving for the new model have been achieved with miniature parts and optimized power device heatsink fin shape. (new model-to-convention model volume ratio is 40%, the mass has been reduced by 8% of the one of the conventional model.)

- Velocity fluctuation has been greatly reduced by optimizing winding current detecting method, with the addition of micro-step driving function
- Output torque in the range of high speed has been greatly improved with the main circuit power supply adapted to DC 48 V.



■ SSCNET Ⅲ-compliant “SANMOTION F3” -series model 3-phase DC power supply stepping driver

In response to the demand for increase in performance of industrial machineries, networks transferring data between equipments at high speeds spread rapidly. SANYO DENKI has developed products conforming to various high-speed networks. “SANMOTION F3” -series model 3-phase DC power supply stepping driver we developed this year adopting SSCNET Ⅲ employing optical communications and possessing higher reliability.

This model features as follows:

The configuration is two-axis in one driver, balancing cost loading for interfacing parts to enhance cost performance.

The current loop in the driver has been digitized in response to the market demand for vibration reduction and high accuracy.

Customer usability has been improved by the following measures:

Add function to control motor holding brake

Improve losing step detecting function

Install electronic gear function conforming to direct acting system

Analog monitor that is useful in starting up system and maintenance has been installed. This function is enabled without any external equipment, to obtain velocity and position information.

■ Batteryless absolute encoder “HA062”

The demand for higher-accuracy servo system used for industrial machineries such as machine tool, industrial robot, and injection molding machine has been increasing year after year. The demand for maintenance-free, higher-reliability as well as higher-accuracy encoder that is a component in servo system, has been increasing. In response to the demand, SANYO DENKI developed Batteryless absolute encoder “HA062.”

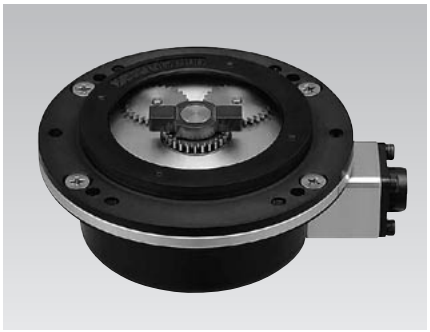
This model features as follows:

- Batteryless encoder, achieved with mechanical gear technology based on resolver-based RA-series model development.
- Absolute position accuracy is 50sec. or less, with the following measures.

Adopt optical counter to single-turn detecting method.

Install a function to compensate mechanical and electrical error.

- The position data reliability has been enhanced with the data obtained by the above optical single-turn detecting method and the magnetic multi- turn detecting method. (We adopted magnetic counter to multi- turn detecting method.)



Note 1: Information as of March 2012, as industrial 2-phase stepping motor, according to SANYO DENKI research.

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