

Servo Systems Division

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The new products and highlights for 2002 and are introduced below.

The "SANMOTION Q" series AC servo motor lineup was completed. The "SANMOTION Q" series offers 54 low and medium inertia motors with small to medium capacity.

The "Core Installed Double Side Type", a linear servo motor, was completed. Using a magnetic induction force offset structure, this new product can simplify a customer's product.

The "PP038", a small and light high resolution incremental encoder, was completed.

The high speed and high torque "30000min⁻¹ AC Servo Motor" was completed for main axis of a machine tool that adopted an internal magnet type (IPM) rotor.

The "SANMOTION Q" series S type AC servo amplifier of power unite and single axis type was completed.

The POINT specification type "SANMOTION PB" amplifier R type, which adopted a highly flexible interface, and includes master functions such as the POINT and program function, was completed.

Development of a small and a high

torque planetary gear (1/81) was completed.

These products, in particular, emphasize the benefit of contributing to a customer's profit and raising the value of a customer's equipment. These products can expect expansion of a market and an increase in use. The outlines and features are described below.

AC Servo Motor "SANMOTION Q" Series

Since "SANMOTION Q" series have a wide variety of applications, all the IP 67 models are waterproof, and are available with power supply voltages of either AC100V, AC200V, or AC400V. The low inertia type, where response is important, has an instant maximum power rate 1.5 to 2 times that of a conventional machine. A shorter position setting time was realized, and the highest rotation speed was raised to 5000min⁻¹, 20% more than a conventional machine. A

medium inertia type, where smooth rotation is important, was made an efficient motor by reducing the cogging torque characteristic to 1/3 - 1/5 of a conventional machine and by a 20% reduction in electric power loss. The "SANMOTION Q" series has an abundant lineup, so a motor can be closely matched with a customer's application. This translates to improved processing accuracy, increased energy savings, increased speed, and low vibration.



Linear Servo Motor "Core Installed Double Side Type"

This linear motor places the core at the magnetic neutral point which counters. This sharply reduced the conventional magnetic power of absorption. The electrical machinery child core of this linear motor is a combination of three kinds of cores: taper core, tea core, joint block cores. Different combinations of cores permit

a broad range of thrust.

With its small magnetic power of absorption, this product contributes to the simplification of a customer's equipment mechanism, and especially to the small size of a linear guide. It can also contribute to a reduction of cost of goods for customer equipment.



Small and light Incremental Encoder “PP038”

It is the high resolution incremental encoder which carries the ASIC. The ASIC can carry out the division output of the slit signal printed on the rotation disk to 2, 4, 8, and 10 times. The maximum response frequency of an output signal attained 2MHz to 300kHz of the conventional model. The maximum resolution is 45,000ppr, and though it measures only 38mm × 26mm, it can support the hollow motor of the 12mm diameter of a motor shaft. The completion of this

encoder can improve the value of the customer's equipment in the following ways:

- In semiconductor equipment, minimize vibration at the time of a stop.
- Improvement of speed stable performance of low speed of measurement equipment (at the time of measurement)=more exact measurement
- Improvement in the speed and the precision of general industrial equipment



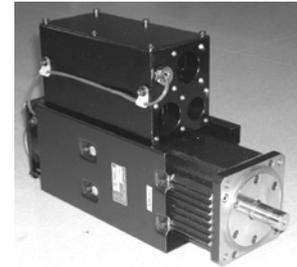
30000min⁻¹ AC Servo Motor

The main axis servo motor was developed from an internal magnet type (IPM) motor. It has the same physique and the same amplifier capacity as the IPM. Also, it is high speed and torque of highest rotation speed 30000min⁻¹. The main features are described below:

- Structure which secures the strength of the centrifugal force resistance of the magnet at the time of high speed rotation.

- Easy to carry out the field weakening control and expand the high speed rotation area.
- Obtained the torque combined with the permanent magnet torque by use of reluctance torque.

This motor is the product which can contribute to raising a machine performance and machine value by high-speed rotation and high acceleration and deceleration.



The AC Servo Amplifier “SANMOTION Q” Series S type of Power Unite And Single Axis Type

The “SANMOTION Q” series amplifier was developed as a highly competitive product, and includes the ability to carry out easy system-up and tuning. The “SANMOTION Q” series S type is a power unite and single axis type with 15A, 30A, 50A, 100A, and 150A models. It reduces size by up to 50% of the volume ratio, when compared the conventional “PY” series product. This allows a size

reduction of customer equipment, and more effective use of space.

- The main features are shown below:
- Cut down the expense and time to configure a system.
 - Improve the accuracy and speed of equipment.
 - Can be used in comfort anywhere in the world.
 - Reduce the running cost of equipment.



Performance Servo “SANMOTION PB” R Type

Point specification R type was carried out in the “SANMOTION PB” series. The amplifier contains the ability to generate a motion profile internally. Nonvolatile memory can store up to 128 points, which are set via serial communications. Also, the R type has the ability to memorize a either four 256 line programs or eight 128 line programs.

Parallel I/O, program start-up, and serial communication (RS-485 conformity) interfaces secure the flexibility of an amplifier which does not need a host controller. Functionally,

it enables stand-alone motion control of various command groups, such as a forcing function of the work required of an electric cylinder, and an automatic home return function.

The model lineup contains three kinds of 1A/2A/3A (DC24/36/48V) input, and can drive a motor of 10W-150W (28mm sq. -60mm sq.).

The demand for broad uses, such as a slider and a cylinder use, semiconductor manufacturing equipment, and general industrial equipments, can be met.



“SANMOTION PB” Motor with Planetary Gear Reducer

The “SANMOTION PB” motor with Planetary gear reducer was produced commercially. The main features are introduced below.

- Reduction ratio (reduction ratio 1:81)
- Rated output rotating speed (40min^{-1})
- Small capacity and lightweight (42mm sq. size)
- High torque transfer performance (rated output torque 6 N·m)
- An input axis and an output axis being the same axis (output axis diameter is $\phi 10$)

Small and high torque Servo system was realized in combination with the “SANMOTION PB” Servo amplifier of our company.

Broad use is expected. Examples include actuators for control, a robot's walking leg, which needs high torque, small general industrial equipment, and semiconductor manufacturing equipment.



Hideyuki Ishii

Joined company in 1989
Servo Systems Division
Worked on the development and the design of
the servo system