

FUJI SERVO SYSTEM

FALDIC ALPHA5



SIMPLE & SMART

ALPHA5

Line of products of ALPHA5 Series

Servo Amplifier

| Model | Command interface | | | | Control mode | | | | Power supply | Capacity | Type | Applicable motor series | |
|---|-------------------|-------|------------|--------|--------------|----------|-------|--------|--------------|--|-----------------|------------------------------|-------------------|
| | Pulse/analog | Di/Do | Modbus-RTU | SX bus | Positioning | Position | Speed | Torque | | | | | |
|  General-purpose interface | VV type | ● | ● | ● | | ● | ● | ● | ● | Single-phase or 3-phase 200 to 240 VAC | 0.05 to 0.75kW | RYT***□5-VV2 | GYS GYC GYG |
| | | | | | | | | | | 3-phase 200 to 240 VAC | 0.85 to 5.0kW | | |
| | | | | | | | | | | Single-phase 100 to 120 VAC | 0.05 to 0.375kW | RYT***□5-VV6 | GYS |
|  High speed serial bus (SX bus) | VS type | | | | ● | ● | ● | ● | | Single-phase or 3-phase 200 to 240 VAC | 0.05 to 0.75kW | RYT***□5-VS2 RYT***□5-LS2 | GYS GYC GYG |
| | | | | | | | | | | 3-phase 200 to 240 VAC | 0.85 to 5.0kW | | |
| | LS type | | | | ● | ● | ● | ● | | Single-phase 100 to 120 VAC | 0.05 to 0.375kW | RYT***□5-VS6 RYT***□5-LS6 | GYS |

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Next generation servo system for ever-evolving machines

Servomotor

| Model | Rated speed (max. speed) | Power supply | Rated output capacity | Servomotor type | | Protective construction | Encoder | Type |
|--|--|--------------|--------------------------------|-----------------|------------|-------------------------|----------------|---------------------|
| | | | | Without brake | With brake | | | |
|  GYS motor Ultra-low inertia | 3000r/min (0.75kW or less: 6000r/min 1.0kW or more: 5000r/min) | 200V series | 11 types 0.05 to 5.0kW | ● | ● | IP67 *1 | 18-bit ABS/INC | GYS***D5-HB2(-B) *2 |
| | | | | | | | 20-bit INC | GYS***D5-RB2(-B) *2 |
|  GYC motor Low inertia | 3000r/min (0.75kW or less: 6000r/min 1.0kW or more: 5000r/min) | 200V series | 7 types 0.1 to 2.0kW | ● | ● | IP67 *1 | 18-bit ABS/INC | GYC***D5-HB2(-B) *2 |
| | | | | | | | 20-bit INC | GYC***D5-RB2(-B) *2 |
|  GYG motor Middle inertia | 2000r/min (3000r/min) | 200V series | 5 types 0.5 to 2.0kW | ● | ● | IP67 *1 | 18-bit ABS/INC | GYG***C5-HB2(-B) *2 |
| | | | | | | | 20-bit INC | GYG***C5-RB2(-B) *2 |
|  GYG motor Middle inertia | 1500r/min (3000r/min) | 200V series | 3 types 0.5, 0.85, 1.3kW | ● | ● | IP67 *1 | 18-bit ABS/INC | GYG***B5-HB2(-B) *2 |
| | | | | | | | 20-bit INC | GYG***B5-RB2(-B) *2 |

*1: Except for shaft-through part (and connectors for GYS and GYC motors of 0.75kW or less).

*2: Models with a brake has "-B" at the end.

Features

Explanation of Model Codes

Specifications of Servo Amplifier

Connection Diagram (Reference)

Option/Peripheral Equipment

Specifications of Servomotor

External Dimensions

Model List

Service Network

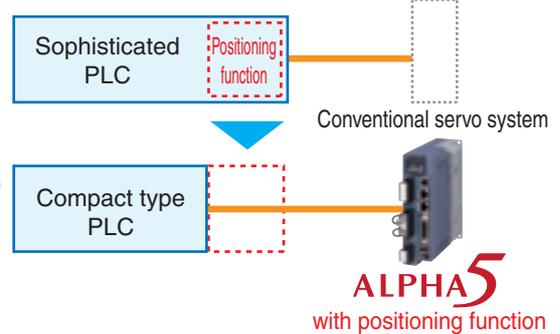
Product Warranty

Compatibility with general-purpose communication: VV type

Simple! PTP positioning

Positioning function is embedded as standard in general purpose interface unit "ALPHA5 VV".

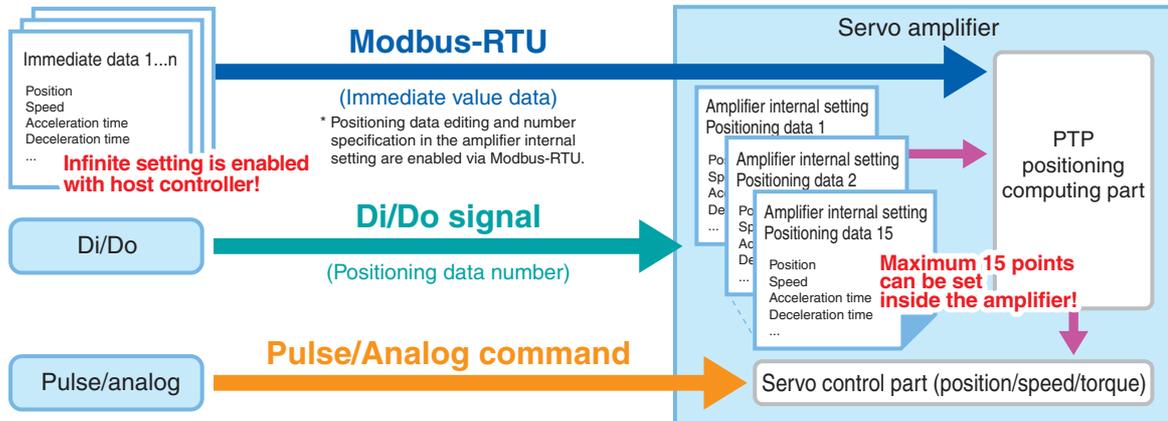
As the ALPHA5 VV type is the standard model, external positioning unit or dedicated items for positioning are not required.



3 in 1 !

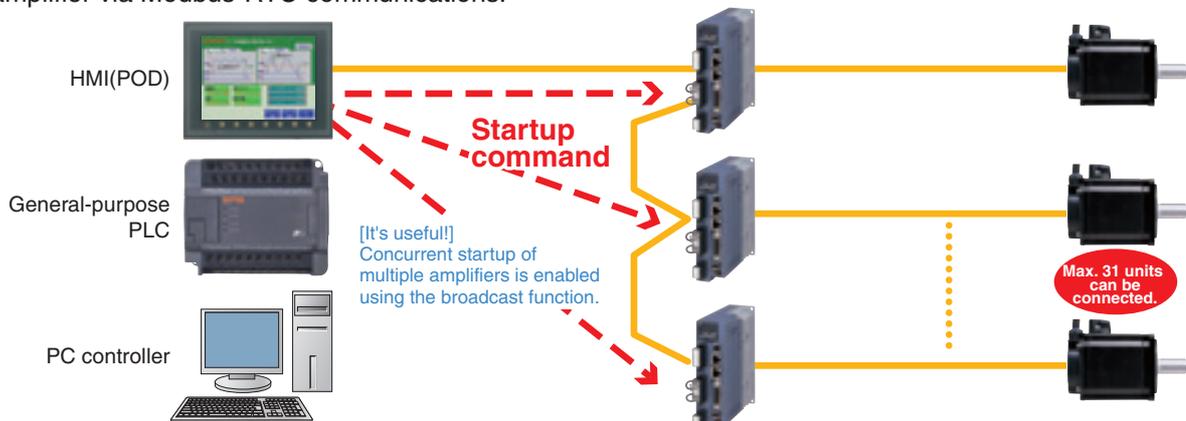
Following operations are enabled by one unit:

- Positioning via Modbus-RTU communications (immediate value data)
- Positioning via Di/Do signal (positioning data 15 points*)
- Controlling positions, speeds and torques via pulse/analog input



Simple connection! Modbus-RTU communications

Operations such as PTP positioning operation, parameter edit, and various monitoring are enabled. All you need to do is connect HMI (POD), general-purpose PLC, or PC controller directly to servo amplifier via Modbus-RTU communications.

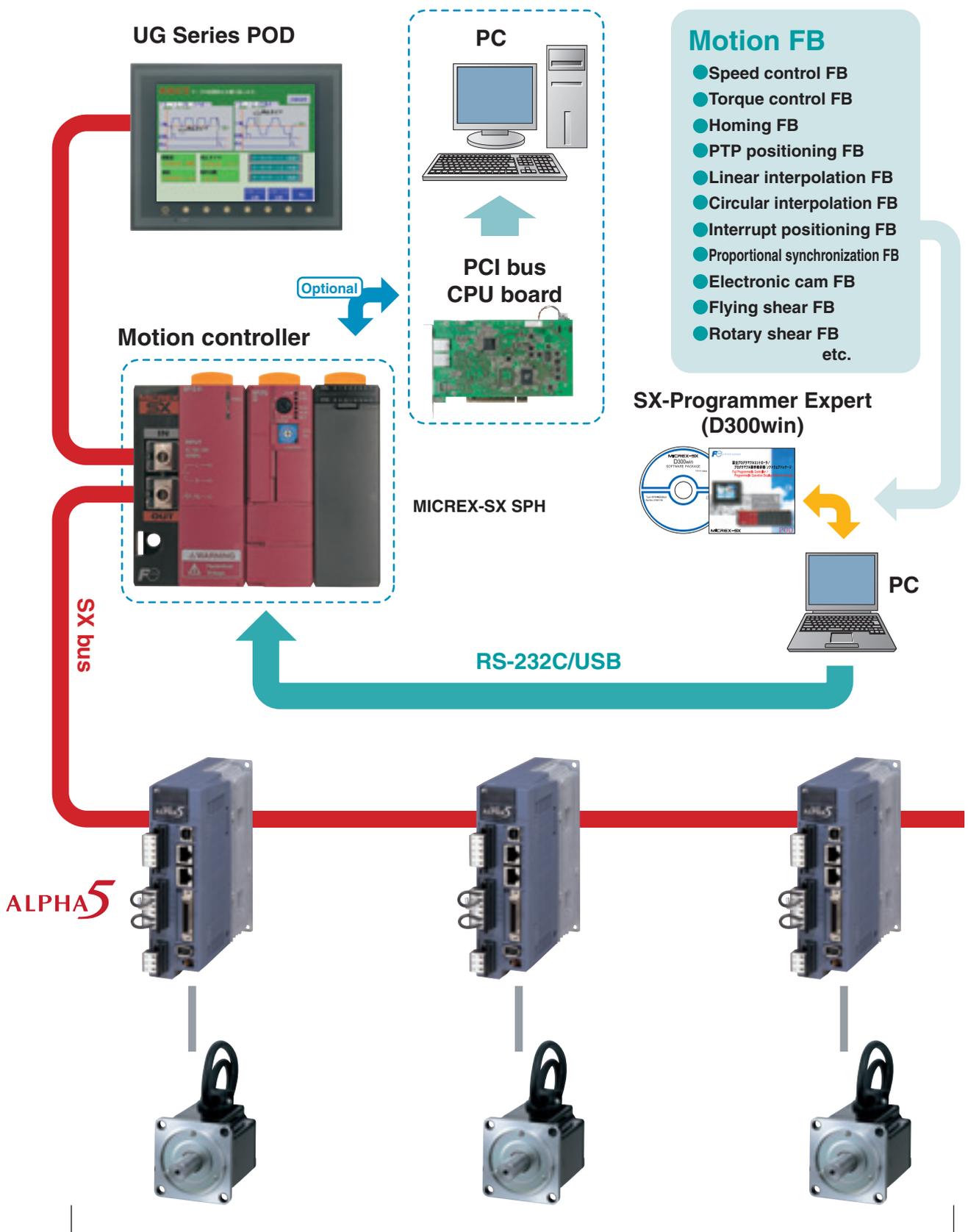


Other makers' products compatible with Modbus-RTU

Any HMI (POD), general-purpose PLC, or PC controller compatible with Modbus-RTU can be connected to servo amplifier easily regardless of maker.

Compatibility with SX bus: VS type and LS type

Sophisticated motion control system that has synchronization and interpolation controls can be configured easily.



- ### Motion FB
- Speed control FB
 - Torque control FB
 - Homing FB
 - PTP positioning FB
 - Linear interpolation FB
 - Circular interpolation FB
 - Interrupt positioning FB
 - Proportional synchronization FB
 - Electronic cam FB
 - Flying shear FB
 - Rotary shear FB etc.

SX-Programmer Expert (D300win)



ALPHA5

Total extension 25m (maximum), 32 connection units (maximum)

Features

Fast and accurate positioning is realized.

New high speed servo control engine
Frequency response 1500Hz

Increased motor rotation speed
Max. rotation speed 6000r/min

Fine resolution encoder
18-bit absolute/incremental 262,144 pulses
20-bit incremental 1,048,576 pulses

High performance frequency response (1500Hz), high rotation speed (6000r/min) and high resolution encoder reduce the cycle time and make faster and more accurate positioning and settling possible.

■ Cycle time reduction 1.2s → 1s

Rotation speed vs Time graph. New Max: 6000r/min, Conventional Max: 5000r/min. Traveling distance: 100 revolutions. About 1s vs About 1.2s. Cycle time reduced by about 20%.

■ Time necessary to settling to 1μm accuracy 4ms

Timing diagram showing Command speed, Feedback speed, Position deviation (±1μm), and Completion signal. Time to settle to 1μm accuracy is 4.0ms.

1/10000 rotation accuracy with a 10mm ball screw = 1μm

New control functions

New notch filter (auto notch filter)

The notch filter is set automatically upon detection of mechanical resonance. Because detection and calculation are always conducted while the auto notch filter remains turned on, resonance frequencies changing by time are effectively filtered.

Mechanical resonance point, Notch filter, Notch filter attenuation, Notch filter frequency. The notch filter frequency and attenuation are automatically set. Resonance is eliminated.

Speed (0 to 500r/min), Torque (0 to 50%). Auto notch filter OFF vs Auto notch filter ON.

Homing by hit-to-stop

Wire saving can be achieved with elimination of the limit switch and over travel signal. Moreover, several homing functions allows homing program creation to be simplified only by combining the servo parameters. Creating complicated program of homing in the host controller is no more necessary.

Motor stop method setting is enabled

- Alarm occurrence
- Main power supply is OFF.
- Servo ON signal is OFF.

Selection among rapid deceleration stop, DB stop, and coast-to-stop is enabled under the above conditions. Since limiting output torque at desired value is possible even if rapid deceleration stops is selected, impact shock to the machine can be reduced.

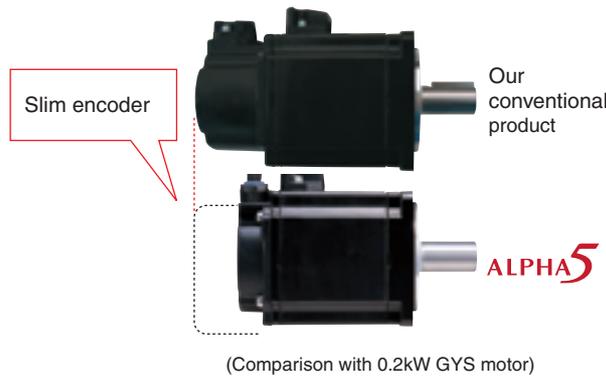
* However, it is enabled when the control power supply is input.

6

Reduced space

Size reduction of servomotor and servo amplifier

- Servo amplifier
The installation area is reduced by 25 to 30% when compared with our conventional model.
- Servomotor
The overall length is reduced by about 15% when compared with our conventional model.



Close installation

The servo amplifier can be installed side by side without a clearance. The installation space in the control panel of the machine is reduced.

* 80% ED rating in case of close installation
There is no limitation if 5mm or a larger clearance is placed.



Close installation can be made even if the ABS backup battery is installed. The battery can be replaced without difficulty while the servo amplifier is left installed.



The designed life time of the battery is about 35000 hours. (Retention time with power turned off)



Long life design

The designed service lives of various parts of the servo amplifier are extended.

Electrolytic capacitor: 10 years
Cooling fan: 10 years

- * Operating conditions
- Ambient temperature: Average 30°C/year
 - Load factor: Within 80%
 - Operation ratio: Within 20 hours/day

Compliance with various standards

Compliance with CE marking and UL/cUL

The standard model complies with CE marking and UL/cUL.



Compliance with RoHS directive

The standard model complies with EU's specific hazardous material limitation (RoHS) directive. The servo system is environmentally friendly because use of six hazardous materials is limited.
<Six hazardous materials>
Lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl (PBB), polybrominated diphenylether (PBDE)

Environmental resistance

IP67 (servomotor)

The standard servomotor model is compatible with IP67* and it can be used in the environment susceptible to water or dust splashes.

* Except for shaft-through part and connectors

Compatibility

Compatibility with FALDIC- α , - β and -W motors

Because compatibility with FALDIC- α , - β and -W Series servomotors is assured, the new amplifier meets requirements for replacement of existing products flexibly. (Compatibility with individual products is planned.)



Improved usability: PC Loader

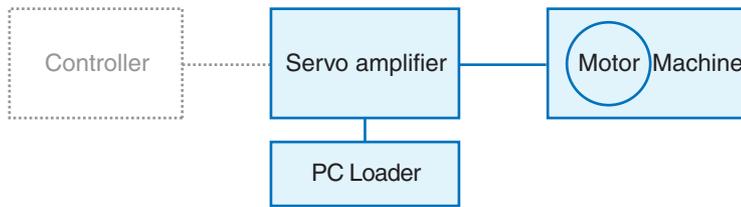
USB connection

The amplifier can be connected to PC using a commercially available USB cable (B-type).

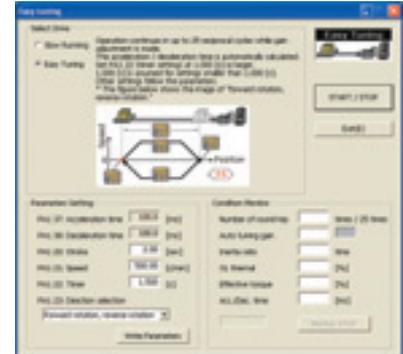
Simple setup

- Easy tuning and profile operation

Because the servo can be adjusted for the machine even if the controller program is not completed, the machine setup time is substantially reduced.



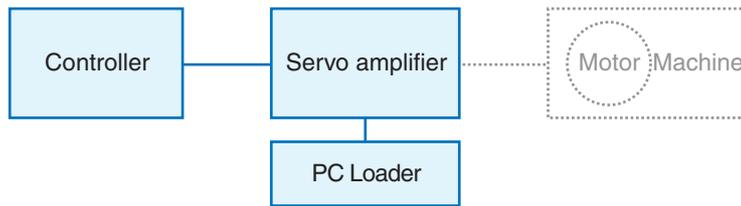
Easy tuning data entry screen



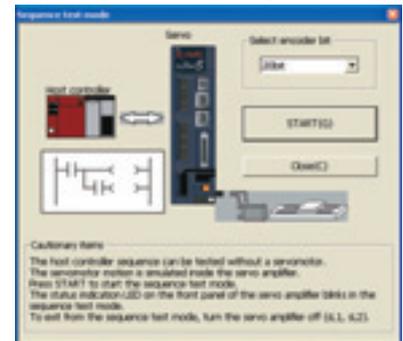
Up to 25 reciprocal motions of the servomotor are conducted while the gain is automatically adjusted.

- Sequence test mode

The controller program can run even if the machine is not completed. The efficiency of program debugging is improved.



Sequence test mode data entry screen



The sequence of the host controller can be tested even if the servomotor is not connected.

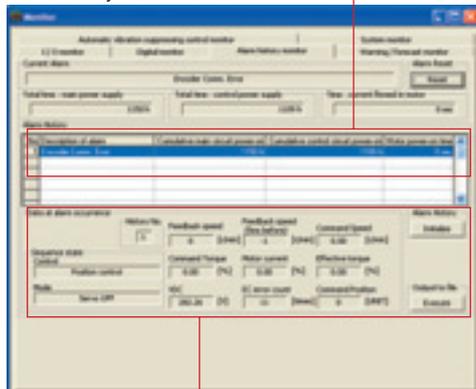
Enriched maintenance functions

- Functions associated with alarm

When an alarm occurs, data such as the speed and torque at alarm occurrence is displayed as well as the description of the alarm. Accurate analyses into the cause of the alarm are possible.

Description of the alarm and various cumulative operation times are displayed.

Alarm history monitor screen



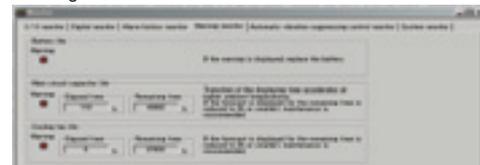
Each piece of data at alarm occurrence is displayed.

- Life warning function

The life of consumable parts of the servo amplifier is calculated.

- Battery life warning
- Main circuit capacity life warning
- Cooling fan life warning

Warning monitor screen



The warning can be issued in a sequence output signal or displayed on the keypad.