

SANMOTION

SERVO SYSTEMS

R

AC 100 V 30W - 200W, AC 200 V 30W - 1kW



SANYO DENKI

Ver.6

SANMOTION R

AC SERVO SYSTEMS

Input voltage **AC100 V, 200 V**

Servo amplifier



Amp. capacity 15A · 30A · 50A

R2 Servo motor



Flange size 40mm · 60mm · 80mm · 86mm



Rated output 30W · 50W · 100W · 200W · 400W · 750W · 1.0kW



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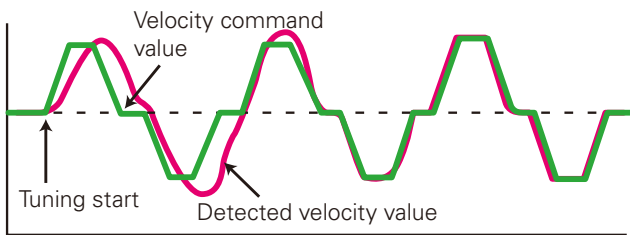
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CONCEPT
1

Easy Set-up for Optimal Operation

Auto-Tuning

A new auto-tuning algorithm improves system response by providing functions such as inertia identification, 5 auto-tuning modes, 30 levels of response, and parameter setting auto-save.



Small Compact Servomotors

Motor size and volume is reduced by as much as 30% and 25% respectively compared to current models. The world's smallest high torque high performance servomotor. (as of Sept 2006)



Multi-Axis Servo Amplifier

6-axis model can reduce installation width by up to 42% compared to six single-axis models. Power loss is reduced by up to 20% compared to current single-axis models.



Protection code IP67

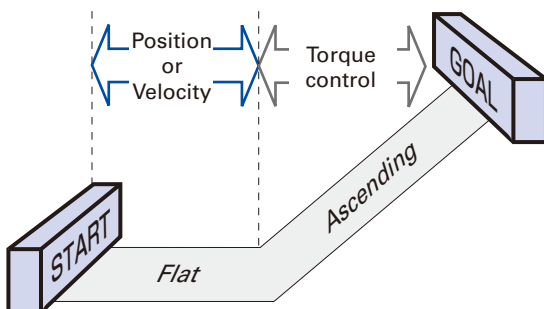
Protection code is IP67 for all models.



*Shaft feedthrough and cable end are excluded.

All-in-One Control

Configurable parameters allow you to switch between control modes for torque, position or velocity.



*Uniaxial servo amplifier only

Power Supply Harmonic Suppression

Equipped with DC reactor connection terminals as standard feature for suppressing power supply harmonics.



5-digit LED Display, Built-in Operator

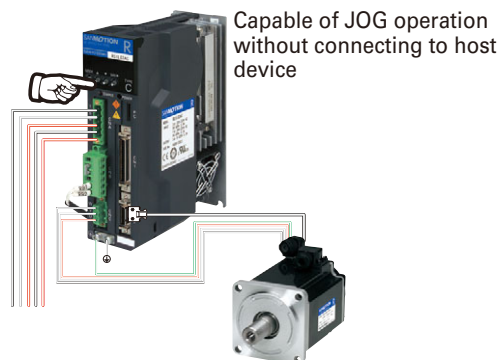
Parameter setting, monitoring and alarm tracing can be easily done using the built-in operator.



*Multi-axis is done through a personal computer.

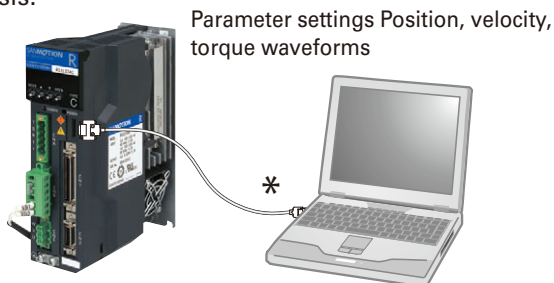
Test Function (JOG)

On-board JOG operation function is available for testing motor and amplifier connection without the need to connect to host device.



Setup Software

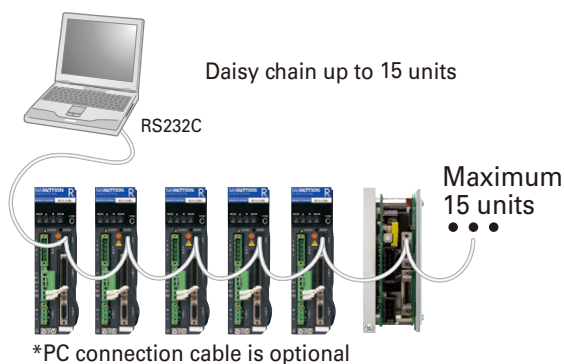
The setup software allows you to set parameters, view graphical displays of monitored position, velocity or torque waveforms, and perform system analysis.



*Use optional cable AL-00490833-01 for PC connection

Multiaxial Monitor Function

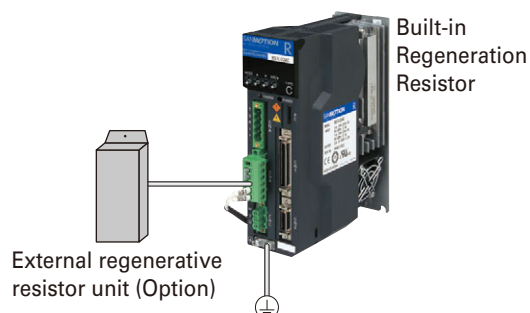
The setup software allows up to 15 amplifiers to be monitored. (Single axis only)



*PC connection cable is optional

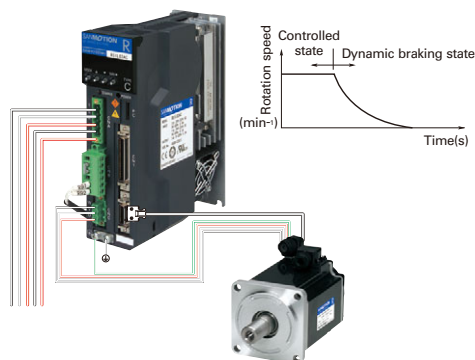
Built-in Regeneration Resistor

It is possible to choose whether to equip regenerative resistance or not. If the regenerative resistance capability is insufficient, it is possible to use an external regenerative resistance unit.



Built-in Dynamic Brake

A built-in dynamic brake provides emergency stop capability. The six kinds of motion sequences for the dynamic brake can be selected by parameter setting.

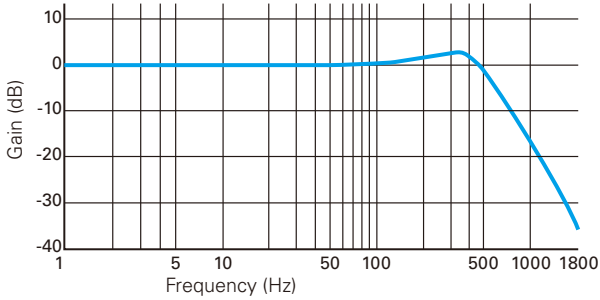


CONCEPT
2

Improved Precision and Reduced Cycle Time

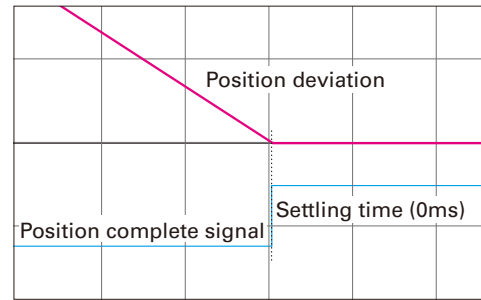
High Response

A 4th-order notch filter reduces phase delay to suppress mechanical resonance and improve velocity response of equipment.



Shorter Position Settling Time

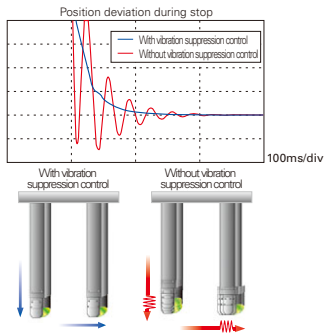
A new algorithm drastically shortens positioning settling time for equipment.



Example of positioning settling time 5ms/div in highly rigid machinery

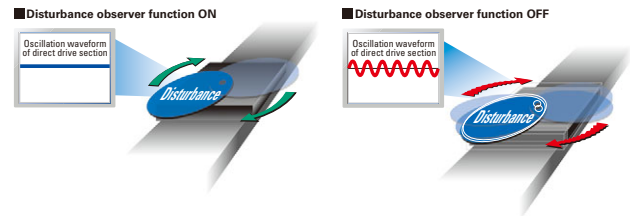
Vibration Suppression Control

With feed-forward vibration suppression control, vibrations at the processing point and base of a machine can be suppressed through simple tuning procedures. Up to 4 types of vibration control frequencies can be selected.



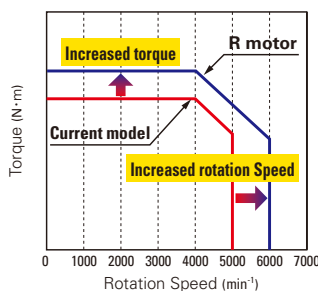
Disturbance Suppression

It is possible to control impacts from other axes in case of multiaxial constitution, by using the new disturbance observer with extended applicable frequency.



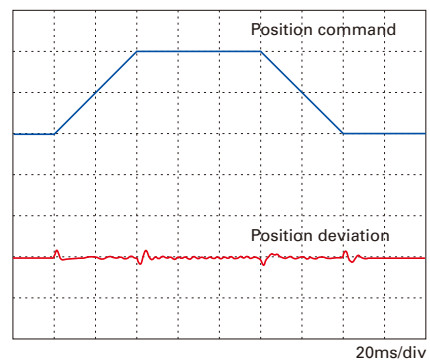
Expanded Power Range

Maximum instantaneous stall torque is improved by 5% to 26%, and maximum rotation speed is increased from 5000min⁻¹ to 6000min⁻¹ compared to current models.



Command Follow-up Control

Performance of the positioning doubled in comparison with current models by adoption of new positioning control algorithm and new speed control algorithm. And position deviation ≈ 0 is achieved.



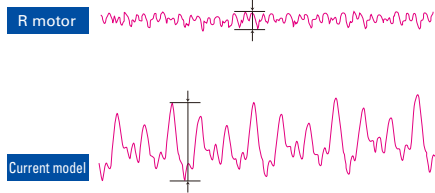
CONCEPT
3

Reduced Running Costs

Low Cogging Torque

Using our proprietary technology, the motor's low cogging torque delivers smooth rotation that is ideal for high precision processes and vibration-sensitive conveyor applications.

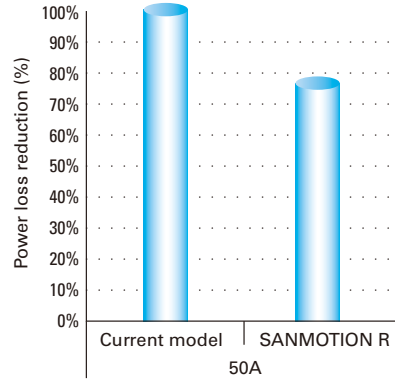
Comparison of cogging torque waveforms



(*Image)

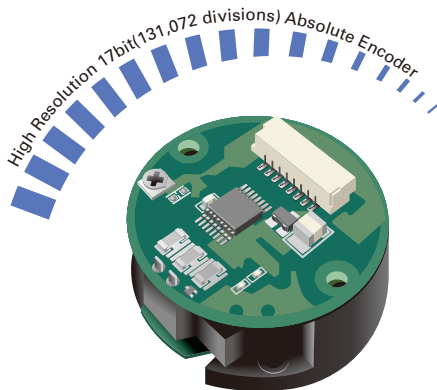
20% Reduction in Power Loss

An energy conserving power module reduces main circuit power loss by up to 20%.



High Resolution

Support for encoders up to 17 bit (131,072 divisions) is available for high resolution control.



Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

Setup Software

Optional Equipment

Servo Motor Standard Model Number List

200V System

Power Voltage	Encoder models	Rated Output	Motor Flange Size	Holding Brake	CE-UL	Model No.				
200V	Battery backup method absolute encoder (PA035C)	30W	40mm sq.	—	—	R2AA04003FXP00				
				—	Standard	R2AA04003FXP00M				
				yes (24V)	—	R2AA04003FCP00				
				yes (24V)	Standard	R2AA04003FCP00M				
		50W	40mm sq.	—	—	—	R2AA04005FXP00			
					—	Standard	R2AA04005FXP00M			
					yes (24V)	—	R2AA04005FCP00			
					yes (24V)	Standard	R2AA04005FCP00M			
					100W	40mm sq.	—	—	—	R2AA04010FXP00
								—	Standard	R2AA04010FXP00M
		60mm sq.	—	—				R2AA06010FXP00		
			—	Standard				R2AA06010FXP00M		
			yes (24V)	—		R2AA06010FCP00				
			yes (24V)	Standard		R2AA06010FCP00M				
		200W	60mm sq.	—		—		—	R2AA06020FXP00	
						—		Standard	R2AA06020FXP00M	
					yes (24V)	—	R2AA06020FCP00			
					yes (24V)	Standard	R2AA06020FCP00M			
					80mm sq.	—	—	R2AA08020FXP00		
						—	Standard	R2AA08020FXP00M		
			yes (24V)			—	R2AA08020FCP00			
			yes (24V)			Standard	R2AA08020FCP00M			
			400W			60mm sq.	—	—	—	R2AA06040FXP00
								—	Standard	R2AA06040FXP00M
					80mm sq.			—	—	R2AA08040FXP00
								—	Standard	R2AA08040FXP00M
		yes (24V)		—		R2AA08040FCP00				
		yes (24V)		Standard		R2AA08040FCP00M				
		750W		80mm sq.	—	—		—	R2AA08075FXP00	
						—		Standard	R2AA08075FXP00M	
			yes (24V)			—	R2AA08075FCP00			
			yes (24V)			Standard	R2AA08075FCP00M			
			1000W			86mm sq.	—	—	—	R2AA08075FXP00
								—	Standard	R2AA08075FXP00M
		yes (24V)		—	R2AA08075FCP00					
		yes (24V)		Standard	R2AA08075FCP00M					
		Absolute encoder for incremental System (PA035S)		30W	40mm sq.			—	—	R2AA04003FXH00
								—	Standard	R2AA04003FXH00M
			yes (24V)			—	R2AA04003FCH00			
			yes (24V)			Standard	R2AA04003FCH00M			
			50W			40mm sq.	—	—	R2AA04005FXH00	
							—	Standard	R2AA04005FXH00M	
	yes (24V)			—	R2AA04005FCH00					
	yes (24V)			Standard	R2AA04005FCH00M					
	100W			40mm sq.	—		—	R2AA04010FXH00		
					—		Standard	R2AA04010FXH00M		
			—		—	R2AA06010FXH00				
			60mm sq.	—	Standard	R2AA06010FXH00M				
				yes (24V)	—	R2AA06010FCH00				
				yes (24V)	Standard	R2AA06010FCH00M				
	200W			60mm sq.	—	—	R2AA06020FXH00			
					—	Standard	R2AA06020FXH00M			
					yes (24V)	—	R2AA06020FCH00			
			80mm sq.	yes (24V)	Standard	R2AA06020FCH00M				
—		—		R2AA08020FXH00						
—		Standard		R2AA08020FXH00M						
400W	60mm sq.	yes (24V)	—	R2AA08020FCH00						
		yes (24V)	Standard	R2AA08020FCH00M						
		—	—	R2AA06040FXH00						
	80mm sq.	—	Standard	R2AA06040FXH00M						
		—	—	R2AA08040FXH00						
		—	Standard	R2AA08040FXH00M						
yes (24V)		—	R2AA08040FCH00							
yes (24V)		Standard	R2AA08040FCH00M							
750W		80mm sq.	—	—	R2AA08075FXH00					
	—		Standard	R2AA08075FXH00M						
	yes (24V)		—	R2AA08075FCH00						
	yes (24V)		Standard	R2AA08075FCH00M						
	1000W		86mm sq.	—	—	R2AA08075FXH00				
				—	Standard	R2AA08075FXH00M				
yes (24V)		—		R2AA08075FCH00						
yes (24V)		Standard		R2AA08075FCH00M						
—		—		R2AAB8100FXH00						
—		Standard		R2AAB8100FXH00M						
yes (24V)	—	R2AAB8100FCH00								
yes (24V)	Standard	R2AAB8100FCH00M								

For specifications on other model, please contact us.

Servo Amplifier Standard Model Number List

200V System

Type	Main Power	Control Power	Encoder Type	Selectable Output	Internal Registration Resistor	Amplifier Capacity	Model No.
CANopen Interface specifications	AC200V System	AC200V System	Wire-saving incremental encoder, Battery backup method absolute encoder	NPN	—	15A	RS1A01AL
						30A	RS1A03AL
						50A	RS1L05AL
					With	15A	RS1L01AL
						30A	RS1L03AL
						50A	RS1A05AL
		DC24V		—	15A	RS1J01AL	
					30A	RS1J03AL	
					50A	RS1J05AL	
				With	15A	RS1K01AL	
					30A	RS1K03AL	
					50A	RS1K05AL	
	AC200V System	AC200V System	Wire-saving incremental encoder, Battery backup method absolute encoder	PNP	—	15A	RS1A01AU
						30A	RS1A03AU
						50A	RS1L05AU
					With	15A	RS1L01AU
						30A	RS1L03AU
						50A	RS1A05AU
		DC24V		—	15A	RS1J01AU	
					30A	RS1J03AU	
					50A	RS1J05AU	
				With	15A	RS1K01AU	
					30A	RS1K03AU	
					50A	RS1K05AU	
Built-in positioning function model	AC200V System	AC200V System	Wire-saving incremental encoder, Battery backup method absolute encoder	NPN	—	15A	RS1A01AC
						30A	RS1A03AC
						50A	RS1L05AC
					With	15A	RS1L01AC
						30A	RS1L03AC
						50A	RS1A05AC

For specifications on other model, please contact us.

Multi-Axis Servo System Amplifier Unit

Type	Power Input	Encoder Type	Selectable Output	Amplifier Capacity	Model No.
Pulse train interface	DC280V	Battery backup method absolute encoder	NPN	15A	RR1A01AAB00
				30A	RR1A03AAB00

Multi-Axis Servo System Power Unit

Type	Power Input	Internal Registration Resistor	Model No.
Pulse train interface	AC200V	With	RRPAA00

Multi-Axis Servo System Motherboard

Power Input	Number of Slots (based on a 15A unit)	Model No.
AC200V	4	RRMA400
	6	RRMA600
	8	RRMA800

Servo Motor Standard Model Number List

100V System

Power Voltage	Encoder models	Rated Output	Motor Flange Size	Holding Brake	CE-UL	Model No.	
100V	Battery backup method absolute encoder (PA035C)	30W	40mm sq.	yes(24V)	—	R2EA04003FCP00	
				yes(24V)	Standard	R2EA04003FCP00M	
				—	—	R2EA04003FXP00	
				—	Standard	R2EA04003FXP00M	
		50W	40mm sq.	yes(24V)	—	R2EA04005FCP00	
				yes(24V)	Standard	R2EA04005FCP00M	
				—	—	R2EA04005FXP00	
				—	Standard	R2EA04005FXP00M	
		80W	40mm sq.	yes(24V)	—	R2EA04008FCP00	
				yes(24V)	Standard	R2EA04008FCP00M	
				—	—	R2EA04008FXP00	
				—	Standard	R2EA04008FXP00M	
		100W	60mm sq.	yes(24V)	—	R2EA06010FCP00	
				yes(24V)	Standard	R2EA06010FCP00M	
				—	—	R2EA06010FXP00	
				—	Standard	R2EA06010FXP00M	
		200W	60mm sq.	yes(24V)	—	R2EA06020FCP00	
				yes(24V)	Standard	R2EA06020FCP00M	
				—	—	R2EA06020FXP00	
				—	Standard	R2EA06020FXP00M	
		Absolute encoder for incremental System (PA035S)	30W	40mm sq.	yes(24V)	—	R2EA04003FCH00
					yes(24V)	Standard	R2EA04003FCH00M
					—	—	R2EA04003FXH00
					—	Standard	R2EA04003FXH00M
	50W		40mm sq.	yes(24V)	—	R2EA04005FCH00	
				yes(24V)	Standard	R2EA04005FCH00M	
				—	—	R2EA04005FXH00	
				—	Standard	R2EA04005FXH00M	
	80W		40mm sq.	yes(24V)	—	R2EA04008FCH00	
				yes(24V)	Standard	R2EA04008FCH00M	
				—	—	R2EA04008FXH00	
				—	Standard	R2EA04008FXH00M	
	100W		60mm sq.	yes(24V)	—	R2EA06010FCH00	
				yes(24V)	Standard	R2EA06010FCH00M	
				—	—	R2EA06010FXH00	
				—	Standard	R2EA06010FXH00M	
200W	60mm sq.		yes(24V)	—	R2EA06020FCH00		
			yes(24V)	Standard	R2EA06020FCH00M		
			—	—	R2EA06020FXH00		
			—	Standard	R2EA06020FXH00M		

For specifications on other model, please contact us.

Servo Amplifier Standard Model Number List

100V System

Type	Main Power	Control Power	Encoder Type	Selectable Output	Internal Registration Resistor	Amplifier Capacity	Model No.
Built-in positioning function model	AC100V System	AC100V System	Wire-saving incremental encoder, Battery backup method absolute encoder	NPN	With	15A	RS1N01AC
						30A	RS1N03AC
					—	15A	RS1E01AC
						30A	RS1E03AC

For specifications on other model, please contact us.

Multi-Axis Servo System Amplifier Unit

Type	Power Input	Encoder Type	Selectable Output	Amplifier Capacity	Model No.
Pulse train interface	DC140V	Battery backup method absolute encoder	NPN	15A	RR1E01AAB00
				30A	RR1E03AAB00

Multi-Axis Servo System Power Unit

Type	Power Input	Internal Registration Resistor	Model No.
Pulse train interface	AC100V	With	RRPEA00

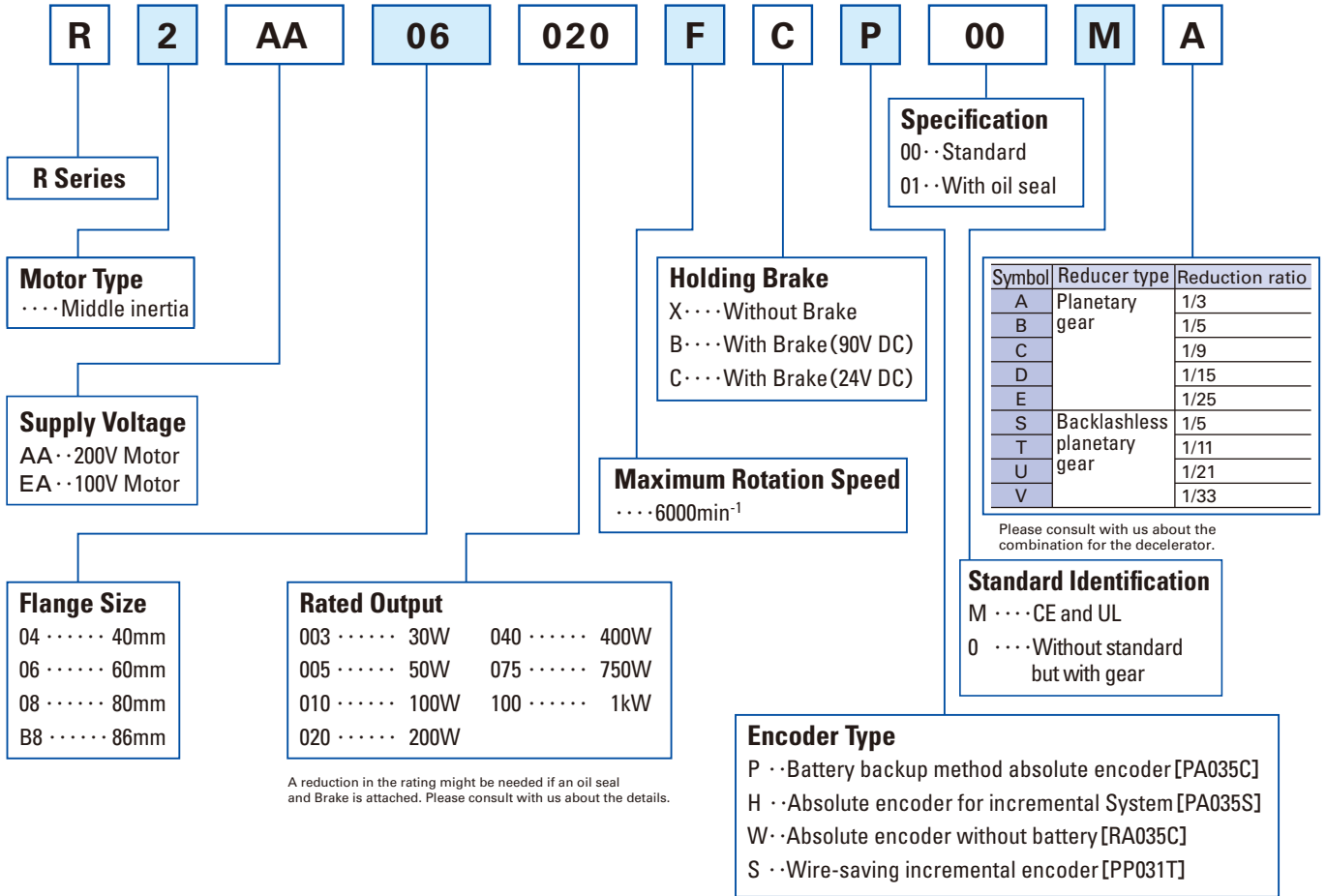
Multi-Axis Servo System Motherboard

Power Input	Number of Slots (based on a 15A unit)	Model No.
AC100V	4	RRME400
	6	RRME600
	8	RRME800

Servo Motor Model Number Nomenclature

Servo Motor

Example: The following model number defines a "R2" servomotor with 60mm flange size, 200W rated output, 6000min⁻¹ maximum rotation speed, 24V brake, and an absolute encoder (131,072 divisions/rotation),UL/CE approval and reduction ratio 1/3.(Planetary gear)



Encoder Specification

Model	Partition number/rotation	Multiple Rotations	Remarks
PA035C	131072(17bit)	65536(16bit)	Battery backup method Absolute encoder
PA035S	131072(17bit)	—	Absolute encoder for Incremental system
RA035C	131072(17bit)	65536(16bit)	Absolute encoder without battery
PP031T	8000(2000P/R)	—	Wire-saving incremental encoder Maximum 40000(Partition number/rotation)

Conformance to Overseas Standards

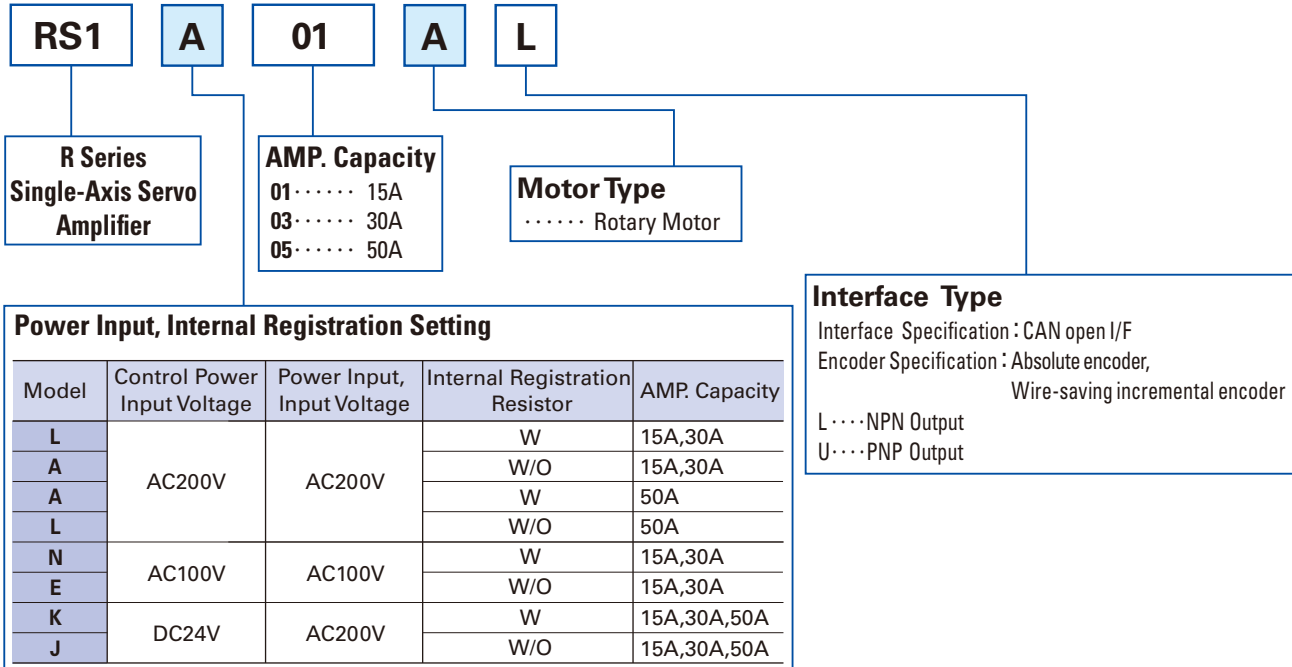
Our standard servo amplifier has attained the international standards (UL, c-UL and EN Standards).

You can also employ servo motors that have attained the international standards (UL, c-UL and EN Standards).



Servo Amplifier with CANopen

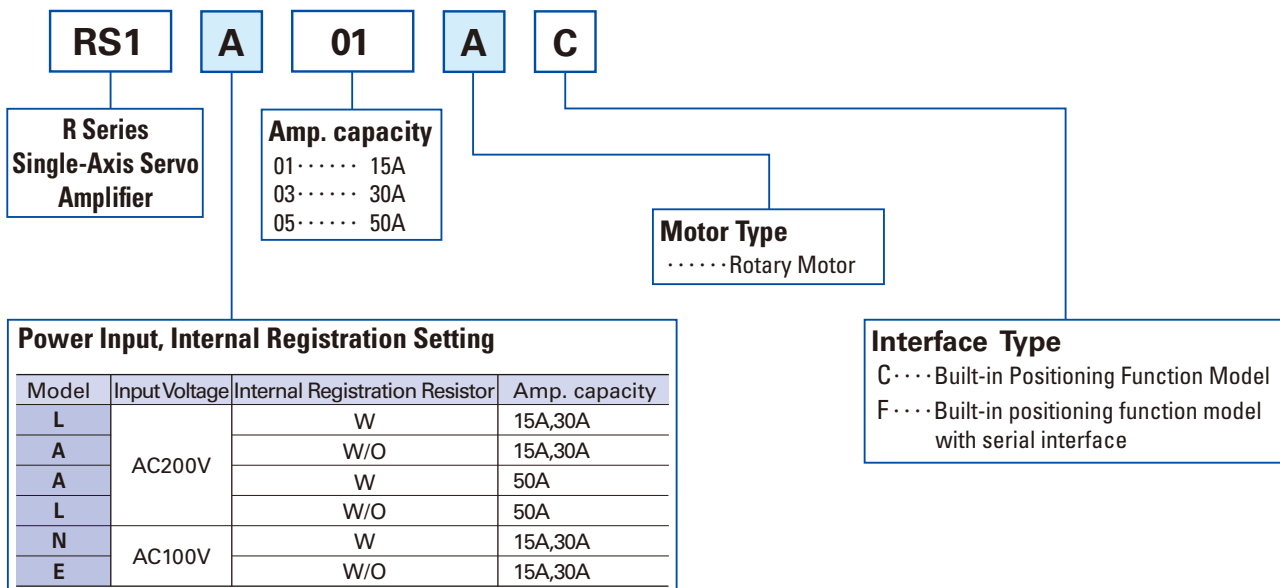
Example: The model number shown below is "R" Series Servo Amplifier with 200V AC input voltage and 15A amplifier capacity.



*The motor parameters need to be set for the amplifier for use. Use the setup software.

Single-Axis Servo Amplifier built-in Positioning Function model

Example: The model number shown below is "R" Series Servo Amplifier with 200V AC input voltage (Main Power and Control Power) and 15A amplifier capacity.



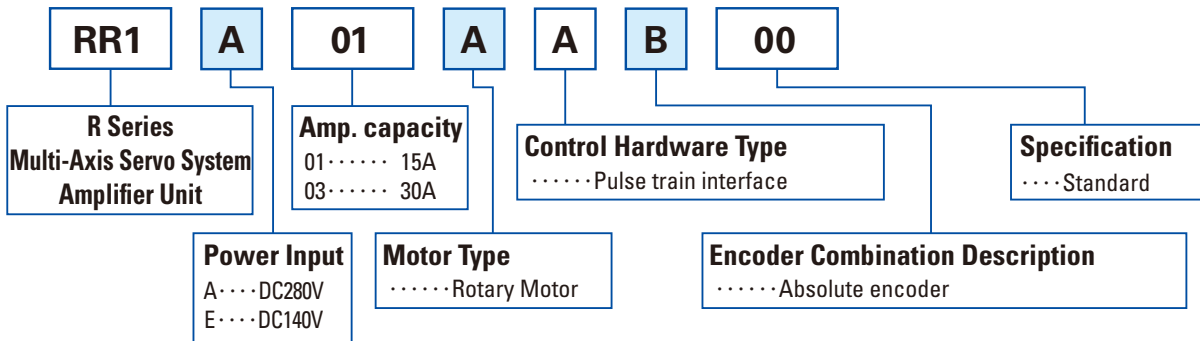
*The motor parameters need to be set for the amplifier for use. Use the setup software.

Multi-Axis Servo Amplifier

Example: The model number shown below is a 4-axis "R" series multiaxis servo amplifier configuration with 200V AC input voltage, 4 units of 15A amplifiers, and pulse train interface.

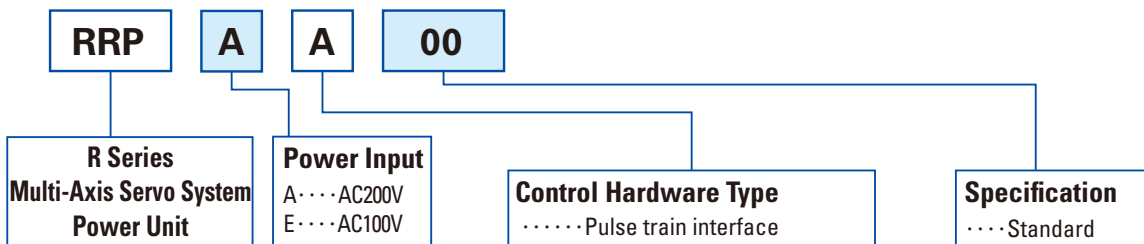
Amplifier Unit RR1A01AAB00 × 4 units
 Power Unit RRPAA00 × 1 unit
 Motherboard RRMA400 × 1 unit

Amplifier Unit

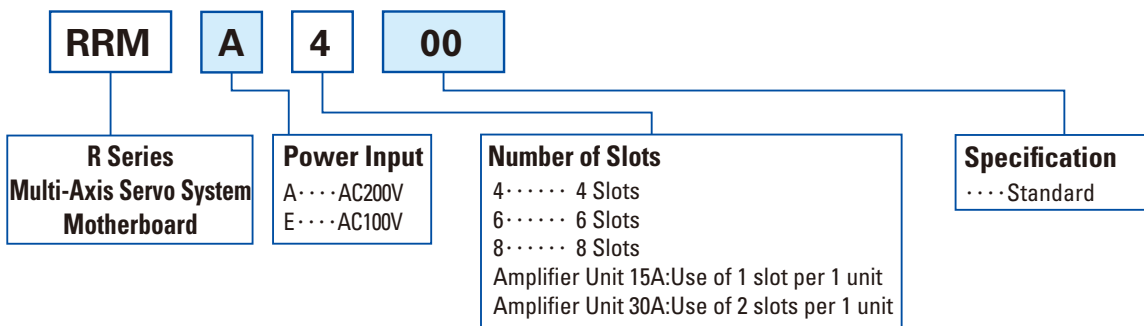


*The motor parameters need to be set for the amplifier for use. Use the setup software.

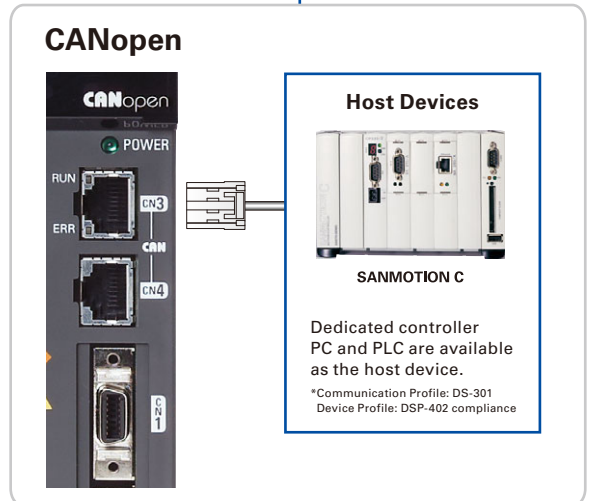
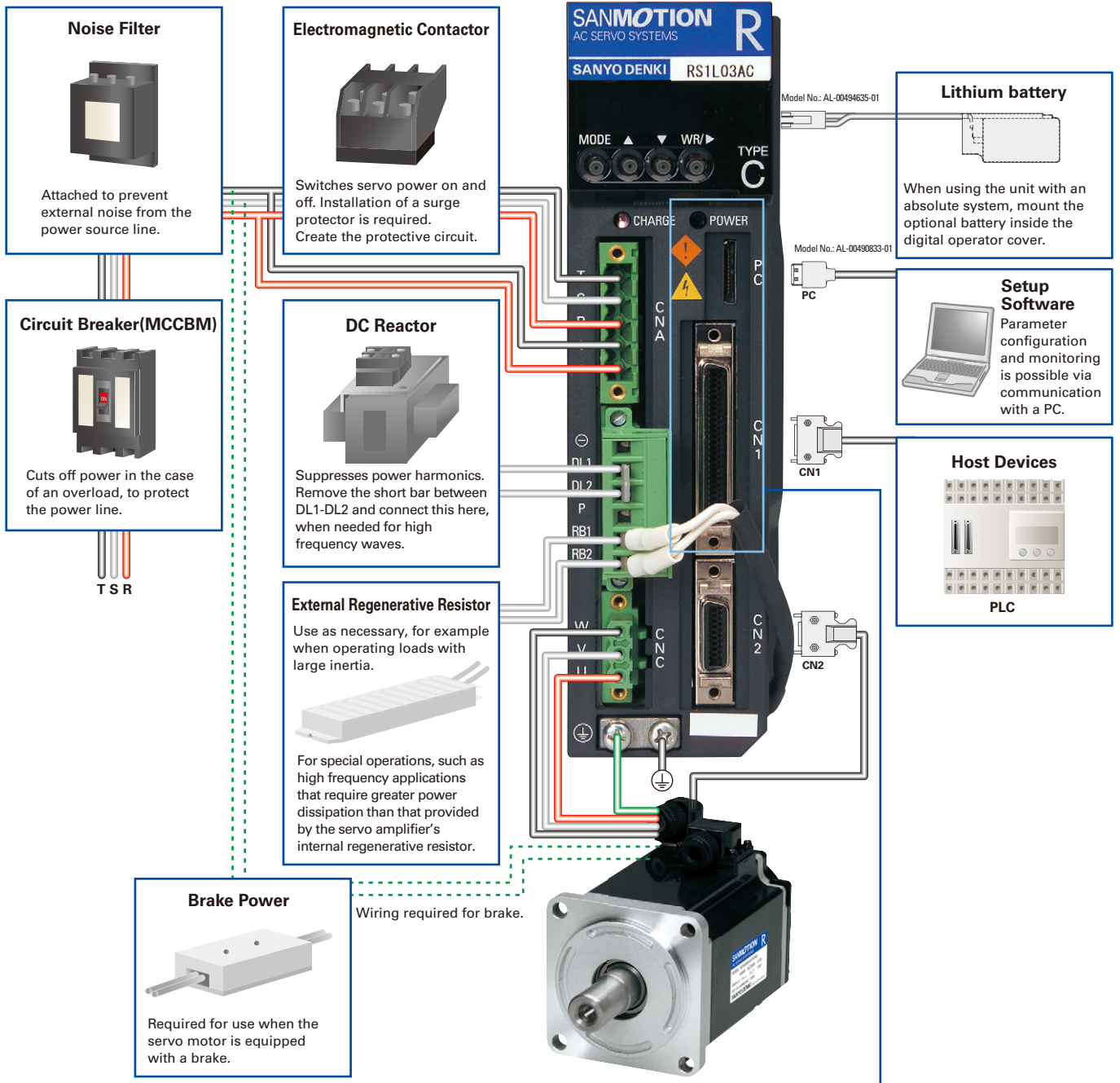
Power Unit



Motherboard

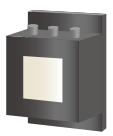


Single-Axis Servo Amplifier




Multi-Axis Servo Amplifier

Noise Filter



Attached to prevent external noise from the power source line.

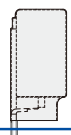
Circuit Breaker(MCCB)




Cuts off power in the case of an overload, to protect the power line.

Lithium battery

When using the unit with an absolute system, connect the battery to CN5.




Setup Software



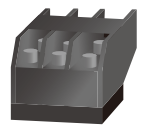
Parameter configuration and monitoring is possible via communication with a PC.

Host Devices



PLC

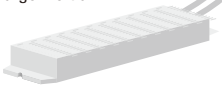
Electromagnetic Contactor



Switches servo power on and off. Installation of a surge protector is required. Create the protective circuit.

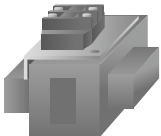
External Regenerative Resistor

Use as necessary, for example when operating loads with large inertia.



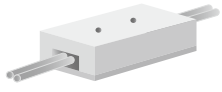
For special operations, such as high frequency applications that require greater power dissipation than that provided by the servo amplifier's internal regenerative resistor.

DC Reactor

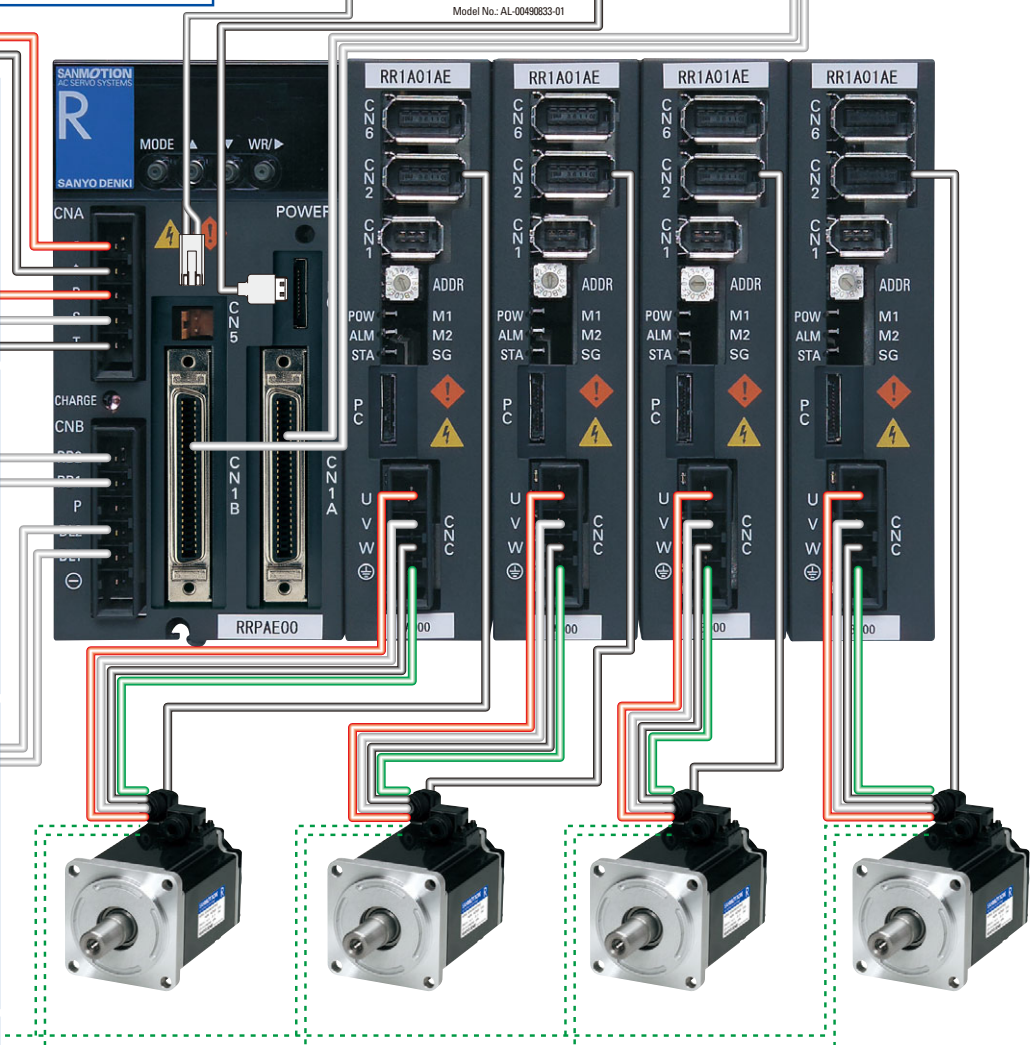


Suppresses power harmonics. Remove the short bar between DL1-DL2 and connect this here, when needed for high frequency waves.

Brake Power



Required for use when the servo motor is equipped with a brake.



Wiring required for brake.

- Features and Functions
- Model Number Nomenclature
- System Configuration
- Standard Specifications
- External Wiring Diagram
- Dimensions
- Setup Software
- Optional Equipment

Standard Specifications



R2

Servo Motor

200V System

Capacity

40mm sq. to 86mm sq.
30W to 1000W

Features

High Efficiency and Low
Ripple (Medium Inertia)

Motor Dwg P24

★:Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

☆:Indicates a typical value when the winding temperature is 20°C.

Motor Model and Flange Size in mm	Status	Symbol	Unit	R2AA04003F	R2AA04005F	R2AA04010F
				<40>	<40>	<40>
Rated Output	★	P _R	W	30	50	100
Rated Speed	★	N _R	min ⁻¹	3000		
Maximum Speed	★	N _{max}	min ⁻¹	6000		
Rated Torque	★	T _R	N·m	0.098	0.159	0.318
Continuous Torque at Stall	★	T _S	N·m	0.108	0.167	0.318
Peak Torque at Stall	★	T _P	N·m	0.37	0.59	1.18
Rated Armature Current	★	I _R	Arms	0.51	0.67	0.81
Armature Current at Stall	★	I _S	Arms	0.56	0.69	0.81
Peak Armature Current at Stall	★	I _P	Arms	2.15	2.8	3.3
Torque Constant	☆	K _T	N·m/Arms	0.201	0.246	0.424
Voltage Constant Per Phase	☆	K _{Eφ}	mV/min ⁻¹	7	8.6	14.8
Phase Resistance	☆	R _φ	Ω	12	9	9.3
Rated Power Rate	★	Q _R	kW/s	3.9	6.7	16
Electrical Time Constant	☆	t _e	ms	0.55	0.67	0.82
Mechanical Time Constant (Not including Encoder)	☆	t _m	ms	2.2	1.7	0.97
Rotor Moment of Inertia (Not including Encoder)		J _m	×10 ⁻⁴ kg·m ² (GD ² /4)	0.0247	0.0376	0.0627
Rotor Moment of Inertia (Encoder)		J _s	×10 ⁻⁴ kg·m ² (GD ² /4)	0.0033 (Note 3)		
Mass including Encoder		WE	kg	0.35	0.39	0.51
Brake Static Friction Torque		TB	N·m	0.32 MIN.		
Brake Rated Voltage		VB	V	DC90V / DC24V ± 10%		
Brake Rated Current		IB	A	0.07 / 0.27		
Rotor Moment of Inertia (Brake)		JB	×10 ⁻⁴ kg·m ² (GD ² /4)	0.0078		
Brake Mass		W	kg	0.27		
Motor Operating Temp, Rel. Humidity				Operating Temperature: 0 to 40°C, Relative Humidity: 90% Maximum, no condensation		
Amplifier Model (Single-Axis)				RS1A01A□		
Amplifier Model (Multi-Axis)				RR1A01AAB00		
Amplifier Power Supply				AC200V to 230V +10, -15% 50/60Hz ± 3Hz (Note 2)		
Amp. Operating Temp. and RH				Operating Temperature: 0 to 55°C (Note1), Relative Humidity: 90% Maximum, no condensation		
Rated power supply			kVA	0.2		0.4
Amplifier Mass (Weight)[Single / CAN / Multi] (Note4)			kg	0.9 / 1.0 / 0.48		

Note 1) The multi-axis type Servo amplifier has an ambient operating temperature of 0 to 40°C. The operating temperature with forced air cooling is 0 to 55°C.

Note 2) In case of the amplifier for CANopen, there is also control power source DC24V type.

Note 3) This is an instance with the battery-backup method absolute encoder (PA035).

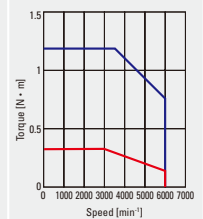
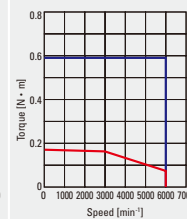
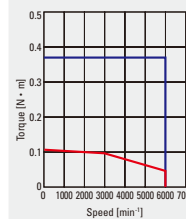
For the following encoders, please make inquiries:

·Absolute encoder without battery [RA035C]

·Red. Wiring Incremental Encoder [PP031T]

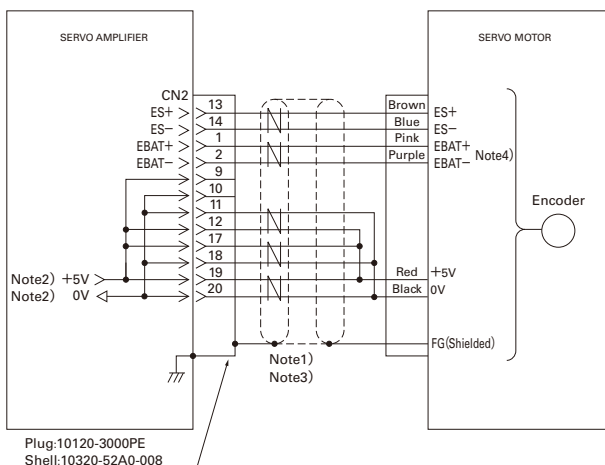
Note 4) The weight in the multi-axial specifications is of amplifier unit only.

* For models with oil seal or brake, reduction in rated value may become necessary.



Encoder Wiring Diagram

Single-Axis Servo Amplifier



Battery backup method absolute encoder [PA035C]

Absolute encoder for incremental system [PA035S]

Absolute encoder without battery [RA035C]

Note 1) Use a twisted-pair shielded cable.

Note 2) Encoder power connections depend on encoder cable length. See the following

Encoder cable length	10m MAX.	25m MAX.	40m MAX.
+5V DC Wiring	Connect pin 19 (Do not connect pins12,17)	Connect pin 17,19 (Do not connect pins12)	Connect pin 12,17,19
0V DC Wiring	Connect pin 20 (Do not connect pins11,18)	Connect pin 18,20 (Do not connect pins11)	Connect pin 11,18,20

Note 3) Use a Awg24 0.2mm² encoder cable

Note 4) When the Absolute encoder for incremental system or absolute encoder without battery is used, battery lines (EBAT+, EBAT-) are not required.

·Multi-Axis Servo Amplifier Wiring diagram → page17

R2AA06010F (60)	R2AA06020F (60)	R2AA06040F (60)	R2AA08020F (80)	R2AA08040F (80)	R2AA08075F (80)	R2AB8100F (86)
100	200	400	200	400	750	1000
3000						
6000						
0.318	0.637	1.27	0.637	1.27	2.39	3.18
0.353	0.686	1.37	0.686	1.37	2.55	3.92
1.13	2.2	4.8	2.2	4.4	8.5	14.3
0.86	1.5	2.8	1.5	2.6	4.6	6.0
0.86	1.6	2.8	1.5	2.6	4.6	6.8
3.5	5.6	10.8	4.8	8.9	15.5	25.7
0.375	0.476	0.524	0.516	0.559	0.559	0.582
13.1	16.6	18.3	18.0	19.5	19.5	20.3
4.8	2.7	1.36	2.3	0.93	0.4	0.44
8.6	19	39	8	16	31	42
2.0	2.6	3.2	2.2	2.5	3.0	4.3
1.2	0.78	0.61	1.3	0.93	0.70	0.93
0.117	0.219	0.412	0.52	1.04	1.82	2.38
0.0033 (Note 3)						
0.71	0.96	1.4	1.3	1.7	2.7	3.6
0.36 MIN.	1.37 MIN.		2.55 MIN.		3.92 MIN.	
DC90V / DC24V ± 10%						
0.07 / 0.27	0.11 / 0.32		0.12 / 0.37		0.30 / 0.09	
0.060	0.060		0.25		0.34	
0.34	0.37		0.89		0.84	

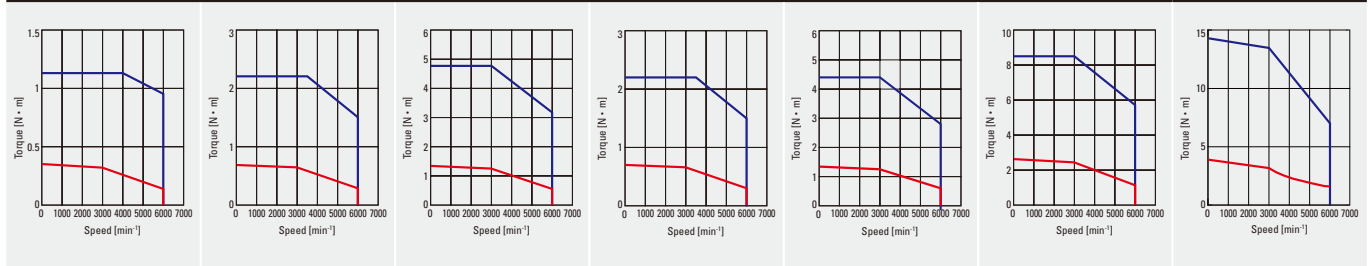
Operating Temperature: 0 to 40°C, Relative Humidity: 90% Maximum, no condensation

RS1A01A□ RR1A01AAB00	RS1A03A□ RR1A03AAB00	RS1A01A□ RR1A01AAB00	RS1A03A□ RR1A03AAB00	RS1A05A□ —
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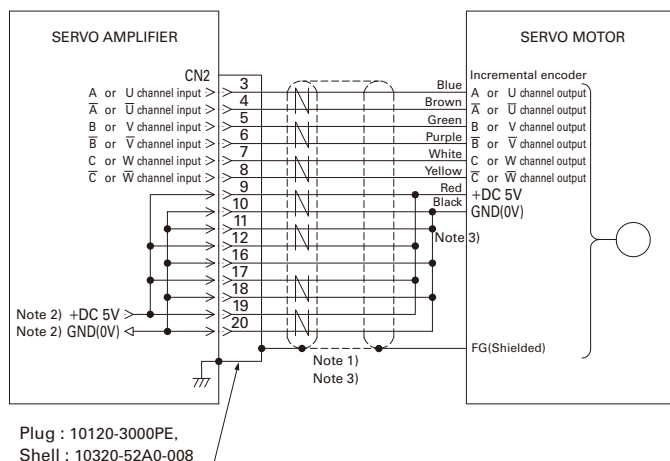
AC200V to 230V +10, -15% 50/60Hz ± 3Hz (Note 2)

Operating Temperature: 0 to 55°C (Note), Relative Humidity: 90% Maximum, no condensation

0.4	0.8	1.0	0.8	1.0	1.7	2.5
0.9 / 1.0 / 0.48		1.0 / 1.1 / 0.77		1.0 / 1.1 / 0.77		2.2 / 2.3 / -



Single-Axis Servo Amplifier



Wire-saving incremental encoder [PP031T]

Note 1) Use a twisted-pair shielded cable.

Note 2) Encoder power connections depend on encoder cable length. See the following

Encoder cable length	5m MAX.	10m MAX.	20m MAX.	30m MAX.
+5V DC Wiring	Connect pin 19 (Do not connect pins 9,12,17)	Connect pin 17,19 (Do not connect pins 9,12)	Connect pin 12,17,19 (Do not connect pins 9)	9,12,17,19 Connect pin
0V DC Wiring	Connect pin 20 (Do not connect pins 10,11,16,18)	Connect pin 18,20 (Do not connect pins 10,11,16)	Connect pin 11,18,20 (Do not connect pins 10,18)	10,11,16,18,20 Connect pin

Note 3) Use a Awg24 0.2mm² encoder cable

Standard Specifications



R2

Servo Motor
100V System

Capacity

40mm sq. to 60mm sq.
30W to 200W
(5 models)

Features

High Efficiency and Low
Ripple (Medium Inertia)

Motor Dwgs P24

★:Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

☆:Indicates a typical value when the winding temperature is 20°C.

Motor Model and Flange Size in mm				R2EA04003F (40)	R2EA04005F (40)
	Status	Symbol	Unit		
Rated Output	★	P _R	W	30	50
Rated Speed	★	N _R	min ⁻¹	3000	
Maximum Speed	★	N _{max}	min ⁻¹	6000	
Rated Torque	★	T _R	N·m	0.098	0.159
Continuous Torque at Stall	★	T _S	N·m	0.108	0.167
Peak Torque at Stall	★	T _P	N·m	0.37	0.59
Rated Armature Current	★	I _R	Arms	0.94	1.2
Armature Current at Stall	★	I _S	Arms	1.0	1.3
Peak Armature Current at Stall	★	I _P	Arms	3.7	4.9
Torque Constant	☆	K _T	N·m/Arms	0.116 ± 10%	0.142 ± 10%
Voltage Constant Per Phase	☆	K _{εφ}	mV/min ⁻¹	4.04 ± 10%	4.97 ± 10%
Phase Resistance	☆	R _φ	Ω	4	3
Rated Power Rate	★	Q _R	kW/s	3.9	6.7
Electrical Time Constant	☆	t _e	ms	0.55	0.67
Mechanical Time Constant (Not including Encoder)	☆	t _m	ms	2.2	1.7
Rotor Moment of Inertia (Not including Encoder)		J _m	×10 ⁻⁴ kg·m ² (GD ² /4)	0.0247	0.0376
Rotor Moment of Inertia (Encoder)		J _s	×10 ⁻⁴ kg·m ² (GD ² /4)	0.0033 (Note 2)	
Mass including Encoder		WE	kg	0.35	0.39
Brake Static Friction Torque		TB	N·m	0.32 MIN.	
Brake Rated Voltage		VB	V	DC90V / DC24V ± 10%	
Brake Rated Current		IB	A	0.07 / 0.27	
Rotor Moment of Inertia (Brake)		JB	×10 ⁻⁴ kg·m ² (GD ² /4)	0.0078	
Brake Mass		W	kg	0.27	
Motor Operating Temp, Rel. Humidity				Operating Temperature: 0 to 40°C, Relative Humidity: 90% Maximum, no condensation	
Amplifier Model (Single-Axis)				RS1E01A□	
Amplifier Model (Multi-Axis)				RR1E01AAB	
Amplifier Power Supply				AC100V to 115V + 10, - 15% 50/60Hz ± 3Hz	
Amp. Operating Temp. and RH				Operating Temperature: 0 to 55°C (Note1), Relative Humidity: 90% Maximum, no condensation	
Rated power supply			kVA	0.2	
Amplifier Mass (Weight) [Single / Multi]			kg	0.9 / 0.48	

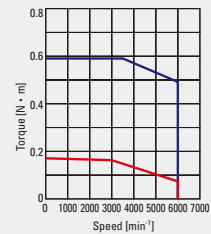
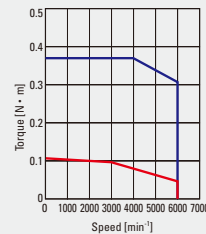
Note 1) The multi-axis type Servo amplifier has an ambient operating temperature of 0 to 40°C. The operating temperature with forced air cooling is 0 to 55°C.

Note 2) This is a instance with the battery-backup method absolute encoder (PA035C).

For the following encoders, please make inquiries:
·Absolute encoder without battery [RA035C]
·Red. Wiring Incremental Encoder [PP031T]

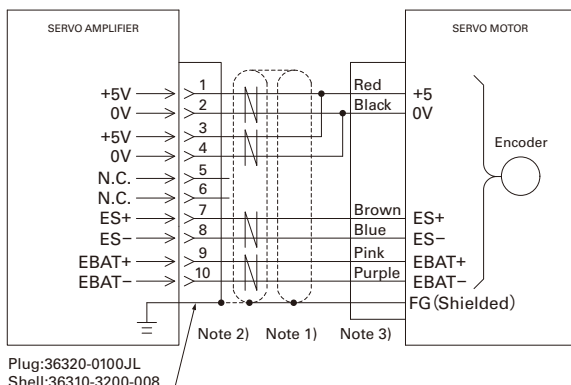
Note 3) The weight in the multi-axial specifications is of amplifier unit only.

* For models with oil seal or brake, reduction in rated value may become necessary.



Encoder Wiring Diagram

Multi-Axis Servo Amplifier



Battery backup method absolute encoder [PA035C]

- Note 1) Use a twisted-pair shielded cable.
- Note 2) The sheathed shield wire should be connected to the metal case (ground) on CN2 side, before connecting to ground on encoder side.
- Note 3) Color symbols shown on the diagram for signal lines on encoder side refer to lead-wire type sensors.
- Note 4) The allowable connection distance between amplifier and encoder varies according to the diameter(impedance) of the electric wire of the cable used. The power voltage specification for encoders is 5V±5%. If the cable is too long, the voltage on encoder side may fall below 5V. Measure the voltage on encoder side to ensure that the cable used is within specification limits.

For the following encoders, please make inquiries:
·Absolute encoder without battery [RA035C]

R2EA04008F (40)	R2EA06010F (60)	R2EA06020F (60)	Unit
80	100	200	W
	3000		min ⁻¹
	6000		min ⁻¹
0.255	0.318	0.637	N·m
0.255	0.318	0.686	N·m
0.86	1.0	2.2	N·m
1.3	1.7	3.1	Arms
1.3	1.7	3.2	Arms
4.5	5.6	11.9	Arms
0.221 ± 10%	0.206 ± 10%	0.224 ± 10%	N·m/Arms
7.7 ± 10%	7.2 ± 10%	7.82 ± 10%	mV/min ⁻¹
2.9	1.5	0.6	Ω
10	8.6	19	kW/s
0.81	1.9	2.6	ms
0.98	1.2	0.79	ms
0.0627	0.117	0.219	×10 ⁴ kg·m ² (60°/4)
	0.0033 (Note 2)		×10 ⁴ kg·m ² (60°/4)
0.51	0.71	0.76	kg
0.32 MIN.	0.36 MIN.	1.37 MIN.	N·m
	DC90V / DC24V ± 10%		V
0.07 / 0.27	0.07 / 0.27	0.11 / 0.32	A
0.0078		0.06	×10 ⁴ kg·m ² (60°/4)
0.27	0.34	0.39	kg
Operating Temperature: 0 to 40° C, Relative Humidity: 90% Maximum, no condensation			
RS1E01A □		RS1E03A □	
RR1E01AAB		RR1E03AAB	
AC100V to 115V +10, -15% 50/60Hz ± 3Hz			
Operating Temperature: 0 to 55° C (Note1), Relative Humidity: 90% Maximum, no condensation			
0.4	0.5	0.8	kVA
0.9 / 0.48		1.0 / 0.77	

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

Setup Software

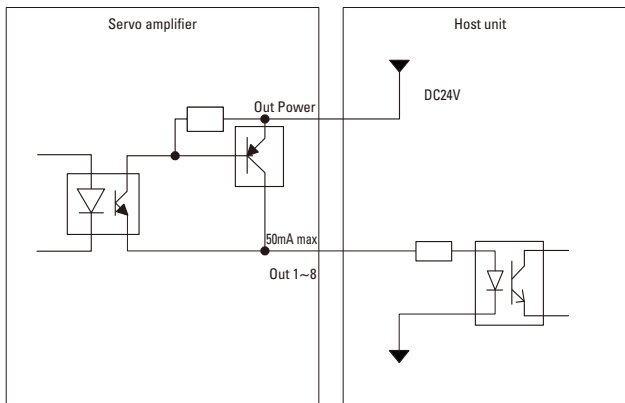
Optional Equipment

General Specifications

CANopen Interface specifications

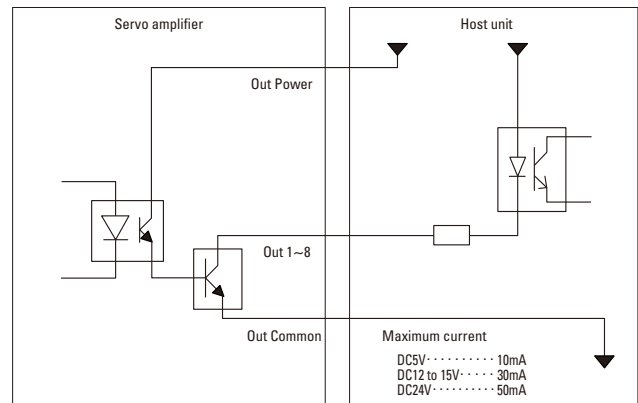
Fieldbus specifications	Bus Connection, Medium	CAN-Standard ISO-11898 (High-speed CAN)	
	Fieldbus	CANopen	
	Communication Profile	CiA DS301 Version 4.02	
	Device Profile	CiA DSP402 (CANopen device profile for drive and motion control) Version 2.0	
	Bit Rate	1Mbps, 800kbps, 500kbps(default setting), 250kbps, 125kbps, 50kbps, 20kbps, 10kbps (Selectable by R-Setup Software)	
	Max. nodes per segment	1 to 127 (Selectable by Double 16-position Rotary Switch or R-Setup Software)	
	Connector	RJ-45 type Modular connector (2 ports) - Pin 1 "CAN_H" high bus line - Pin 2 "CAN_L" low bus line - Pin 3,7 "CAN_GND" Ground - Pin 6 "CAN_SHIELD" Cable Shield - Pin 5 "Terminator" (120 ohm; if necessary, attach a jumper between Pin1 and Pin5)	
	Transceiver	ISO-11898 compliant high-speed transceiver	
	Max. Bus Length	25m (for 1Mbps)	
	Communication Objects	SDO (Service Data Object) EMCY (Emergency) SYNC (Synchronization Object)	PDO (Process Data Object) NMT (Network Management) Heartbeat
PDO Transfer Modes	Synchronous transmission	Asynchronous transmission	
Mode of Operation	Homing Mode (h.m) Profile Velocity Mode (p.v) Profile Torque Mode (t.q)	Profile Position Mode (p.p) Interpolated Position Mode (i.p)	

PNP output



The output port counts are different depending on the specification.

NPN output



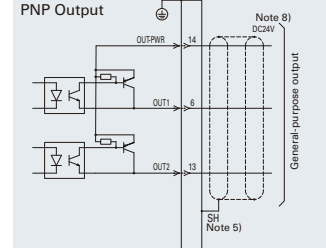
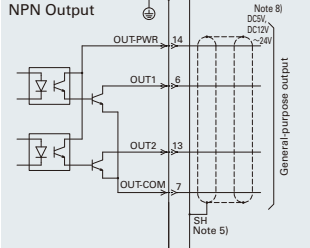
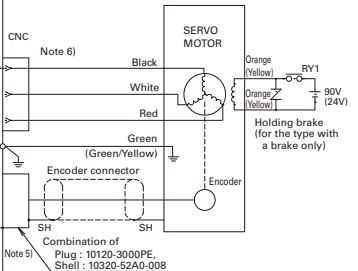
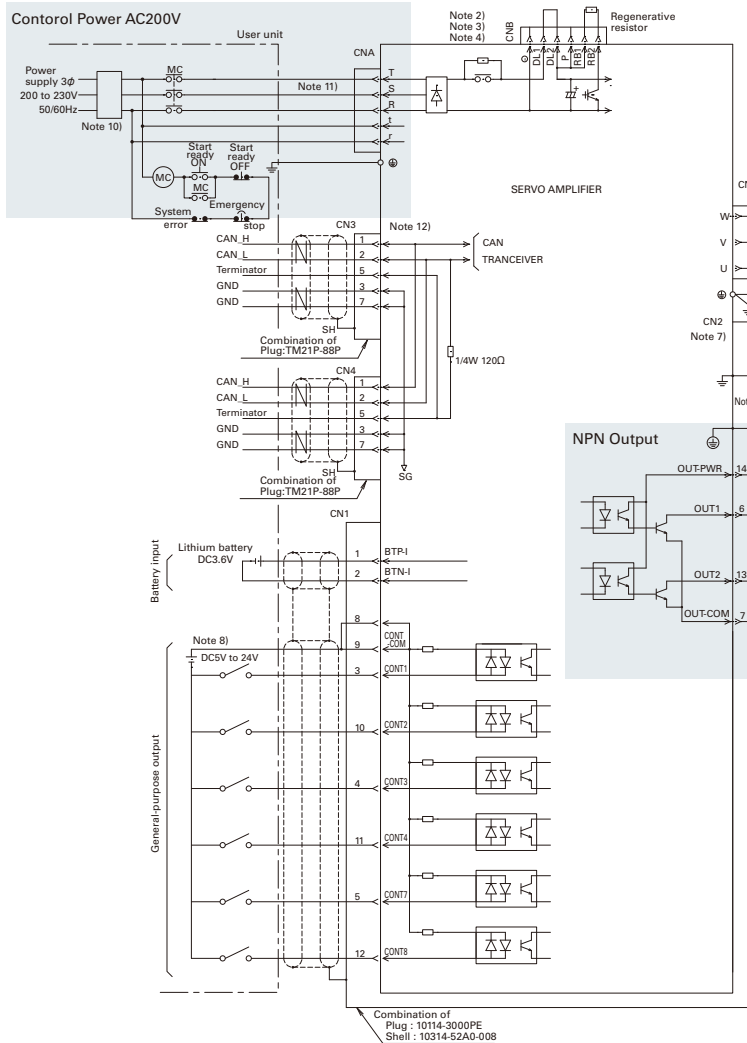
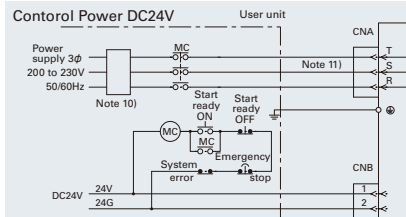
The output port counts are different depending on the specification.

Single-Axis Servo Amplifier built-in positioning function serial interface model

Item	Content	Default value	Remark
Protocol	Modbus-RTU	—	Binary mode fixed (ASCII mode is un-corresponding)
Interface	RS-485 (1 : N)	—	N=Maximum is 32 (Note)
Band rate (bps)	4800, 9600, 19200, 38400, 57600, 115200	115200	Set with the setup software or the rotary switch on the front of the amplifier.
Start bit	1	1	Fixed
Data length (bit)	8	8	Fixed
Parity	None, even/odd number	even	
Stop bit	1, 2	1	Set with the setup software.
Electric specification	Based on RS-485 (half duplex communication)	Based on RS-485 (half duplex communication)	Fixed
Connector	RJ-45	—	

Note) Based on the specifications for a typical RS-485 physical layer (distance, terminating resistance), the number of servo amplifiers (or other slave devices) that can be connected to a single segment is a maximum of 31 axes (with no repeater). However, with this servo amplifier, the standard product can have a maximum of 8 axes connected. Please contact us if connecting 9 axes or more.

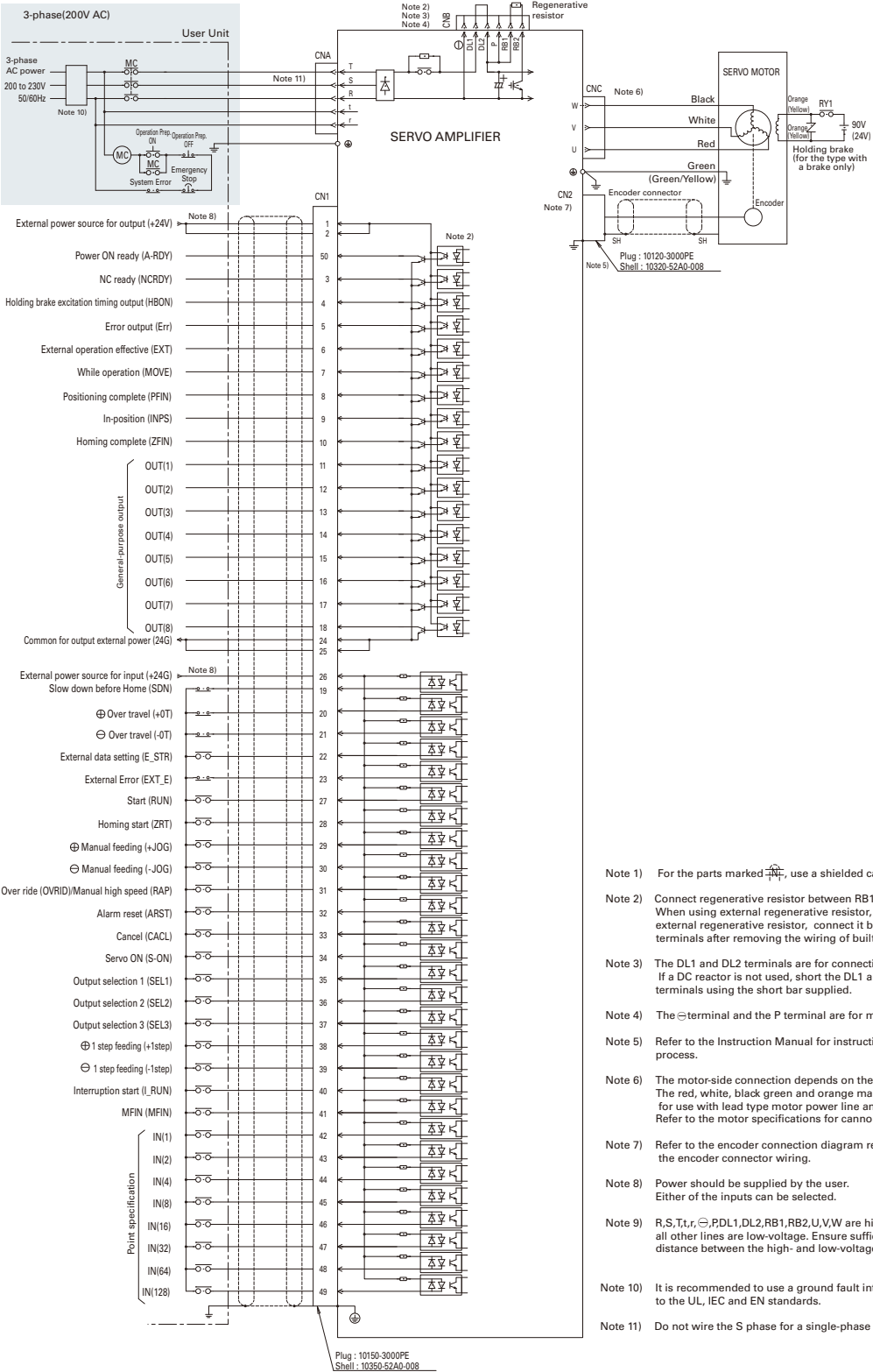
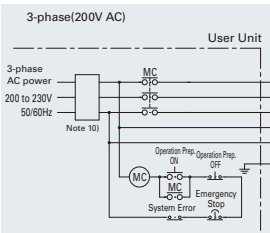
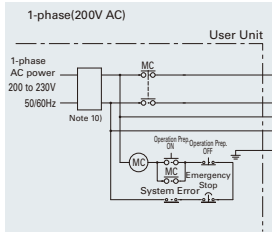
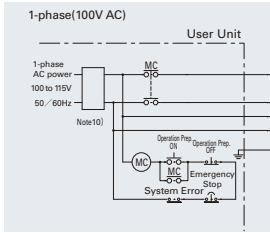
Single-Axis Servo Amplifier with CANopen



- Note 1) For the parts marked , use a twisted pair shielded cable.
- Note 2) Connect a regenerative resistor between terminals RB1-RB2. When using an external regenerative resistor, first remove the internal regenerative resistor wiring between terminals RB1 and RB2, and then connect an external regenerative resistor between terminals RB1-RB2.
- Note 3) The DL1 and DL2 terminals are for connecting a DC reactor. If a DC reactor is not used, short the DL1 and DL2 terminals using the short bar supplied.
- Note 4) The ⊖ terminal and the P terminal are for maintenance (high-voltage circuit).
- Note 5) Refer to the Instruction Manual for instructions on the shielding process.
- Note 6) The motor-side connection depends on the motor specification. The red, white, black green and orange markings are for use with lead type motor power line and brake line. Refer to the motor specifications for cannon plug type connections.
- Note 7) Refer to the encoder connection diagram regarding the encoder connector wiring.
- Note 8) Power should be supplied by the user. Either of the inputs can be selected.
- Note 9) R, S, T, r, ⊖, P, DL1, DL2, RB1, RB2, U, V, W are high-voltage circuits, all other lines are low-voltage. Ensure sufficient distance between the high- and low-voltage circuits.
- Note 10) It is recommended to use a ground fault interrupter conforming to the UL, IEC and EN standards.
- Note 11) Do not wire the S phase for a single-phase power amplifier.
- Note 12) Insert RJ45 connector to which 1pin(CAN_H) and 5pin(Terminator) are short-circuited in CN3 or CN4 when the terminator is necessary.

- Features and Functions
- Model Number Nomenclature
- System Configuration
- Standard Specifications
- External Wiring Diagram
- Dimensions
- Setup Software
- Optional Equipment

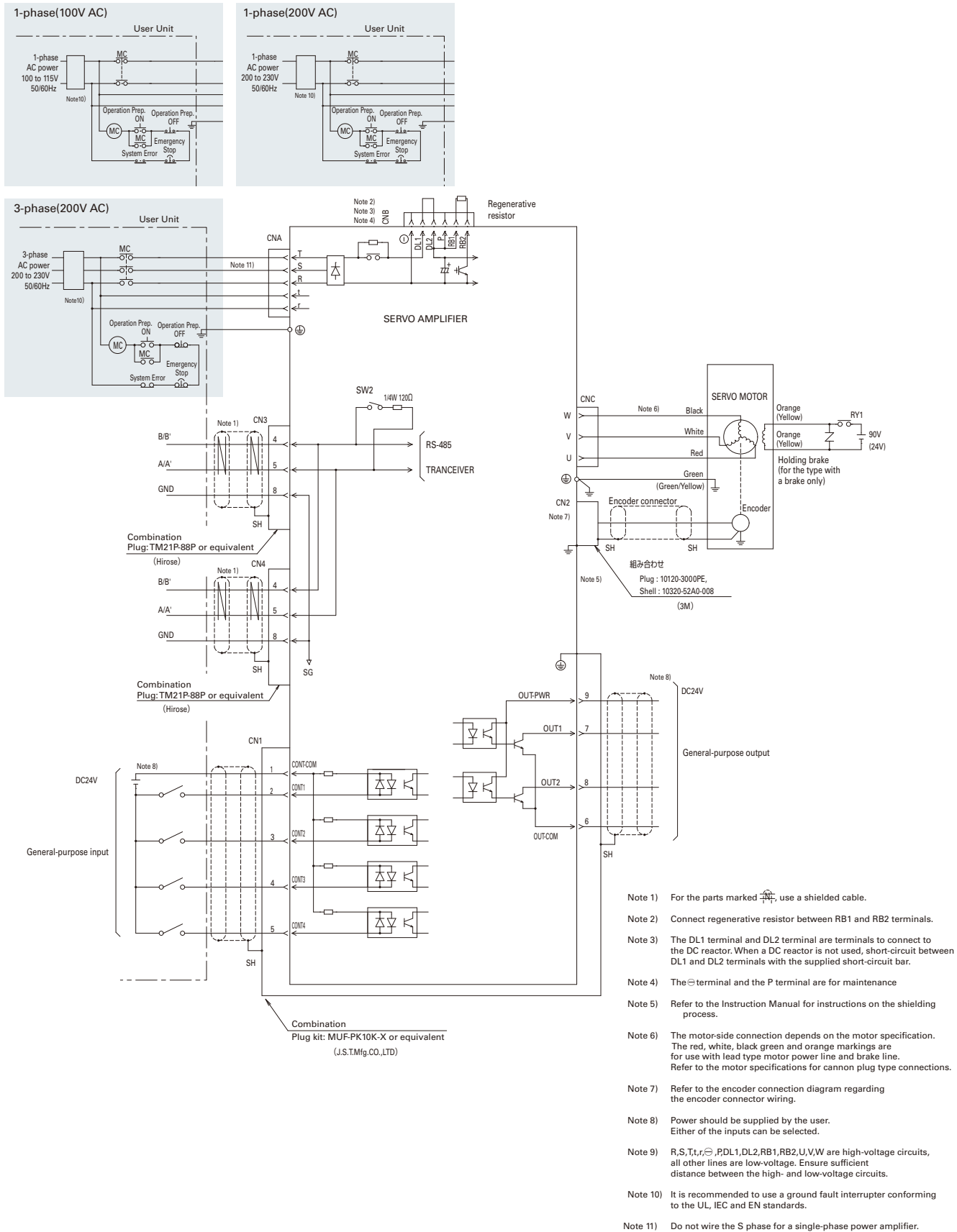
Single-Axis Servo Amplifier built-in positioning function model



- Note 1) For the parts marked , use a shielded cable.
- Note 2) Connect regenerative resistor between RB1 and RB2 terminals. When using external regenerative resistor, terminals. When using external regenerative resistor, connect it between RB1 and RB2 terminals after removing the wiring of built-in regenerative resistor.
- Note 3) The DL1 and DL2 terminals are for connecting a DC reactor. If a DC reactor is not used, short the DL1 and DL2 terminals using the short bar supplied.
- Note 4) The ⊖ terminal and the P terminal are for maintenance
- Note 5) Refer to the Instruction Manual for instructions on the shielding process.
- Note 6) The motor-side connection depends on the motor specification. The red, white, black green and orange markings are for use with lead type motor power line and brake line. Refer to the motor specifications for cannon plug type connections.
- Note 7) Refer to the encoder connection diagram regarding the encoder connector wiring.
- Note 8) Power should be supplied by the user. Either of the inputs can be selected.
- Note 9) R, S, T, r, ⊖, PDL1, DL2, RB1, RB2, U, V, W are high-voltage circuits, all other lines are low-voltage. Ensure sufficient distance between the high- and low-voltage circuits.
- Note 10) It is recommended to use a ground fault interrupter conforming to the UL, IEC and EN standards.
- Note 11) Do not wire the S phase for a single-phase power amplifier.

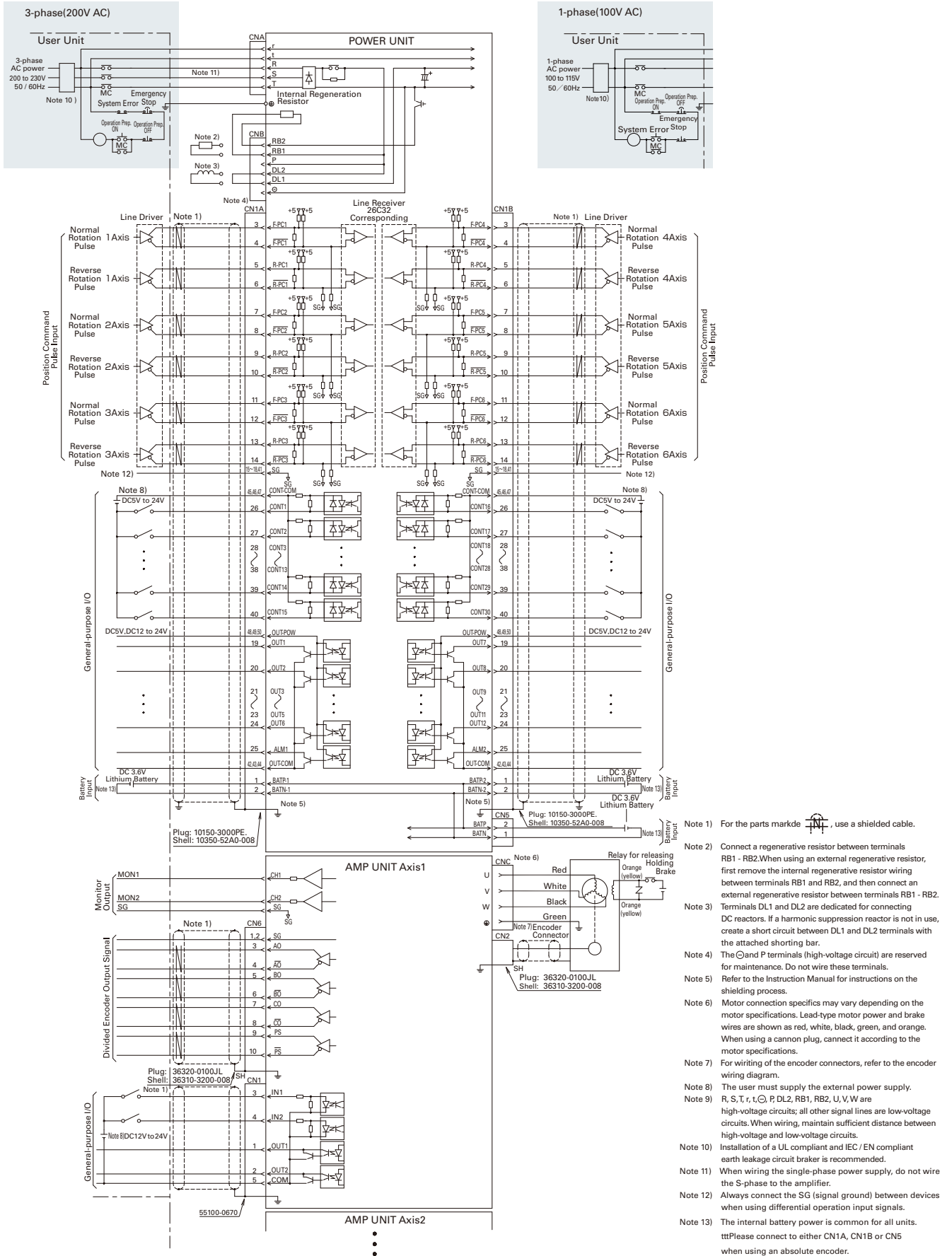
Plug : 10150-3000PE
Shell : 10320-5240-008

Single-Axis Servo Amplifier built-in positioning function serial interface model

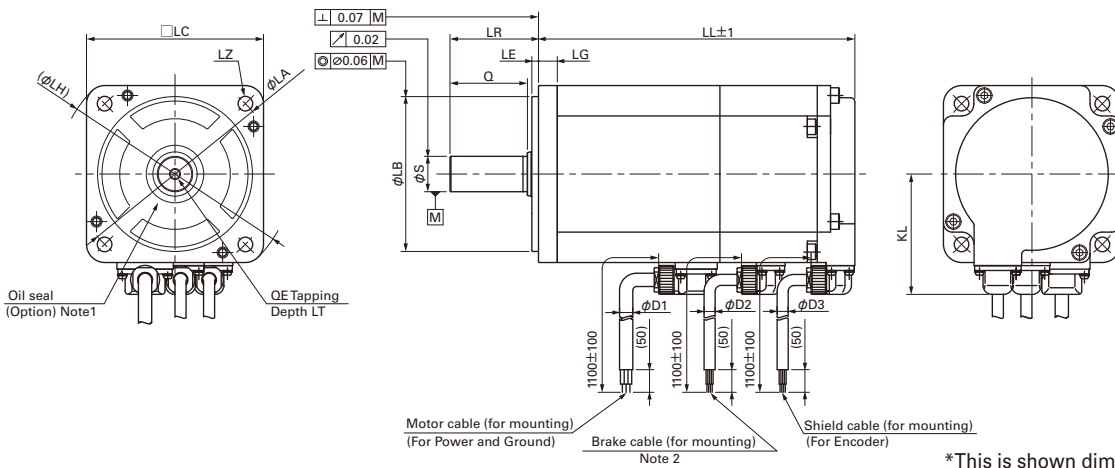


- Features and Functions
- Model Number Nomenclature
- System Configuration
- Standard Specifications
- External Wiring Diagram
- Dimensions
- Setup Software
- Optional Equipment

Multi-Axis Servo Amplifier



Servo Motor Dimensions (Unit : mm)



*This is shown dimension for motor with brake

R2 Servo Motor High Efficiency and Low Ripple (Medium Inertia)

MODEL	Battery backup method absolute encoder				LG	KL	LA	LB	LE	LH	LC	LZ	LR
	W/out oil seal		With oil seal <small>Note 1</small>										
	W/out brake	With brake	W/out brake	With brake									
R2□A04003 △□◇	51.5	87.5	56.5	92.5	5	35.4	46	30-0.021 ⁰	2.5	56	40	2-∅4.5	25
R2□A04005 △□◇	56.5	92.5	61.5	97.5									
R2EA04008 △□◇	72	108	77	113									
R2AA04010 △□◇					6	44.6	70	50-0.025 ⁰	3	82	60	4-∅5.5	25
R2□A06010 △□◇	58.5	82.5	65.5	89.5									
R2□A06020 △□◇	69.5	97.5	76.5	104.5									
R2AA08020 △□◇	66.3	102	73.3	109	8	54.4	90	70-0.030 ⁰	3	108	80	4-∅6.6	30
R2AA06040 △□◇	95.5	123.5	102.5	130.5									
R2AA08040 △□◇	78.3	114	85.3	121									
R2AA08075 △□◇	107.3	143	114.3	150	8	54.4	90	70-0.030 ⁰	3	108	80	4-∅6.6	40
R2AA8100 △□◇	137	163	137	163									
R2AA8100 △□◇					8	59.4	100	80-0.030 ⁰	3	115.5	86	4-∅6.6	35

MODEL	S	Q	QE	LT	D1	D2	D3
R2□A04003 △□◇	6-0.008 ⁰	20	—	—	6	5	5
R2□A04005 △□◇							
R2EA04008 △□◇	8-0.009 ⁰						
R2AA04010 △□◇							
R2□A06010 △□◇	8-0.009 ⁰	25	—	—	6	5	5
R2□A06020 △□◇							
R2AA08020 △□◇	14-0.011 ⁰						
R2AA06040 △□◇							
R2AA08040 △□◇		35	M5	12	6	5	5
R2AA08075 △□◇	16-0.011 ⁰						
R2AA8100 △□◇	16-0.011 ⁰	30	M5	12	6	5	5

Note 1: The total length of the motor varies when an oil seal is necessary. (Excluding 86mm sq.)

Note 2: Brake connectors (cables) are not supplied for models without brakes.

Note 3: A reduction in the rating might be needed if an oil seal and Brake is attached. Please consult with us about the details.

For the following encoders, please make inquiries:

- Absolute encoder without battery [RA035C]
- Red. Wiring Incremental Encoder [PP031T]

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

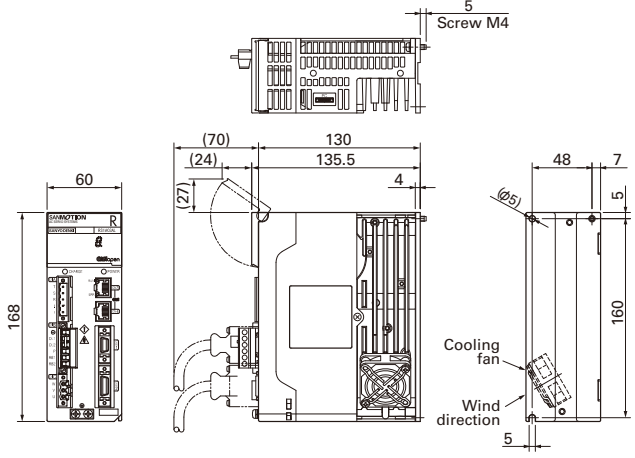
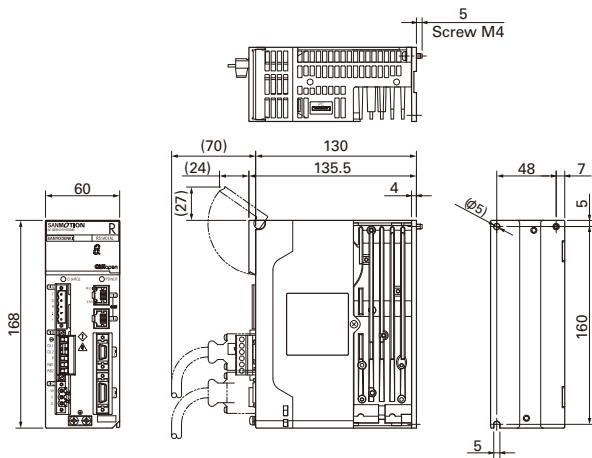
Setup Software

Optional Equipment

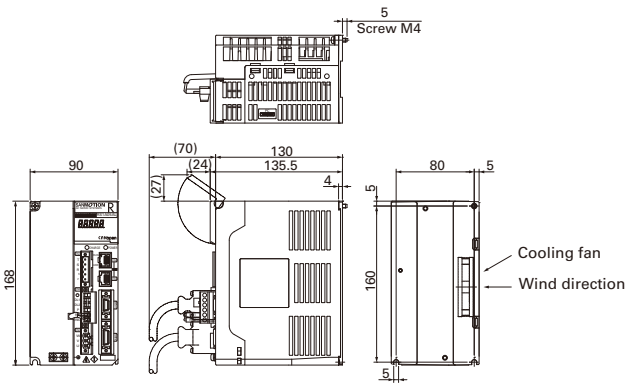
Single-Axis Servo Amplifier with CANopen (Power control AC200V)

RS1A01A □ (15A)

RS1A03A □ (30A)



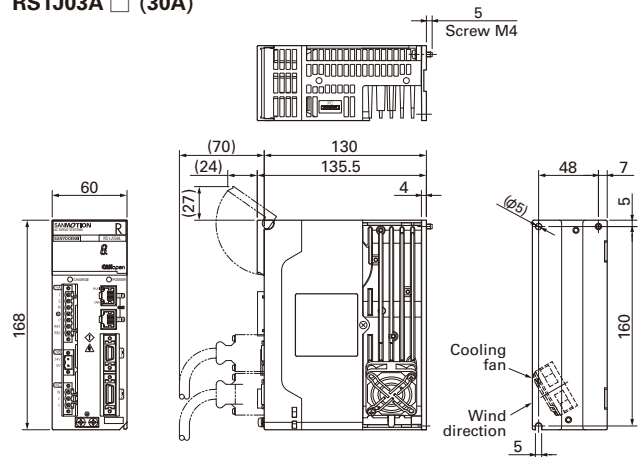
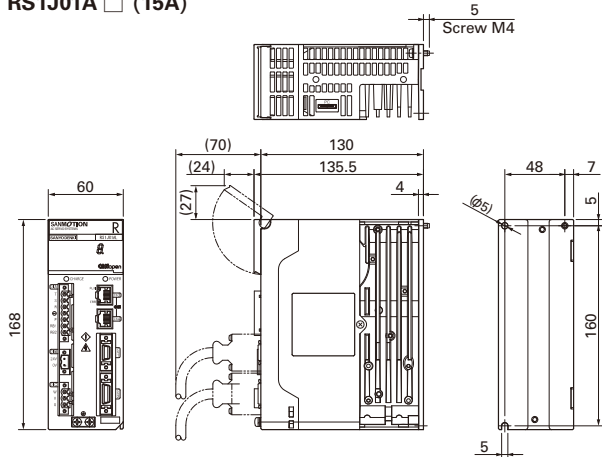
RS1A05A □ (50A)



Single-Axis Servo Amplifier with CANopen (Power control DC24V)

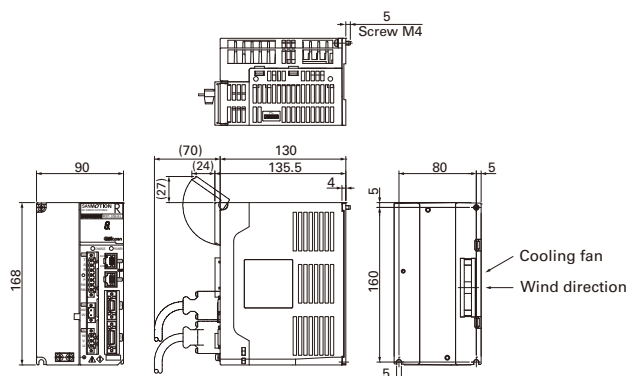
RS1J01A □ (15A)

RS1J03A □ (30A)



Single-Axis Servo Amplifier with CANopen (Power control DC24V)

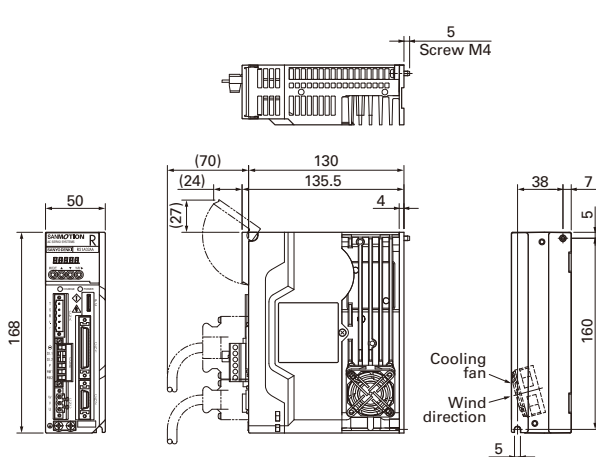
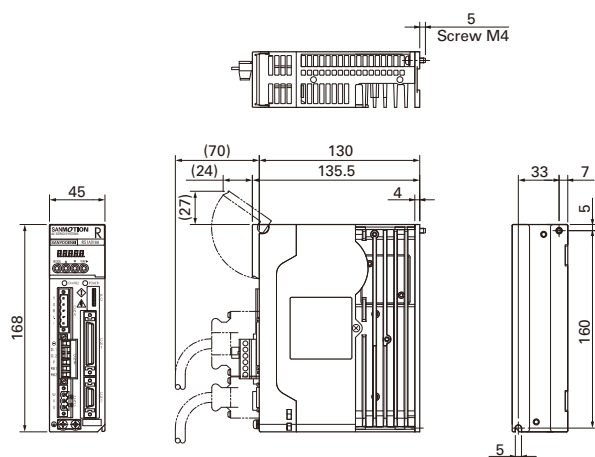
RS1J05A □ (50A)



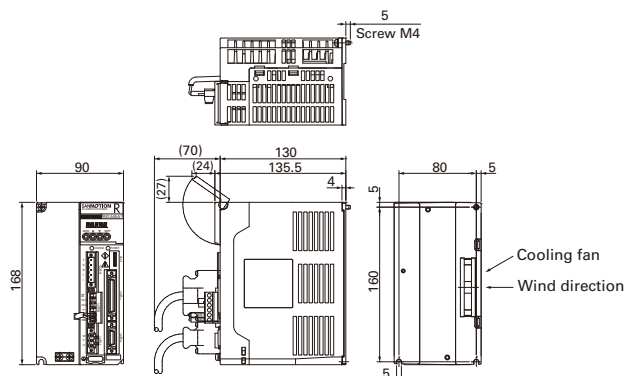
Single-Axis Servo Amplifier built-in positioning function model

RS1 □ 01A □ (15A)

RS1 □ 03A □ (30A)



RS1 □ 05A □ (50A)



Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

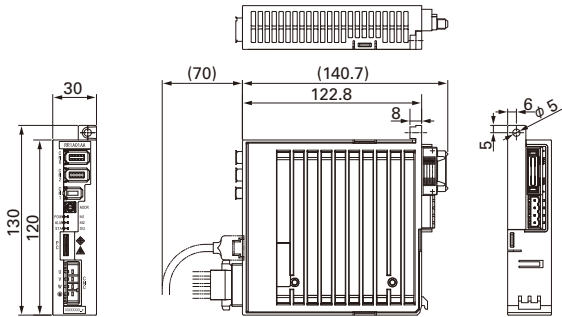
Setup Software

Optional Equipment

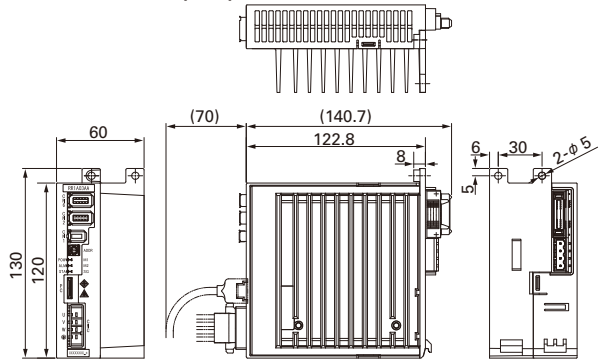
Multi-Axis Sever Amplifier

Amplifier Unit

RR1A01AAB00 (15A)

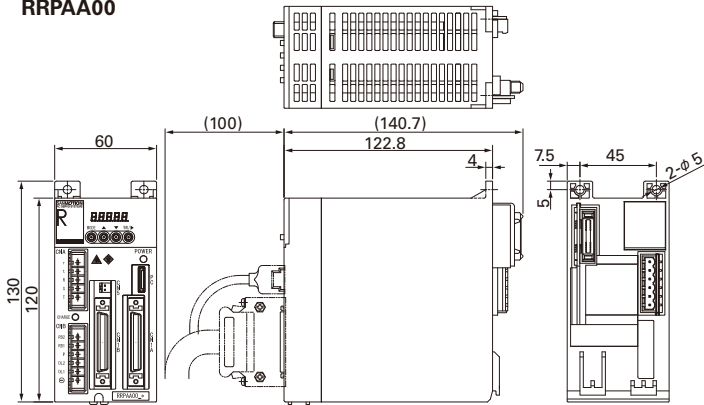


RR1A03AAB00 (30A)

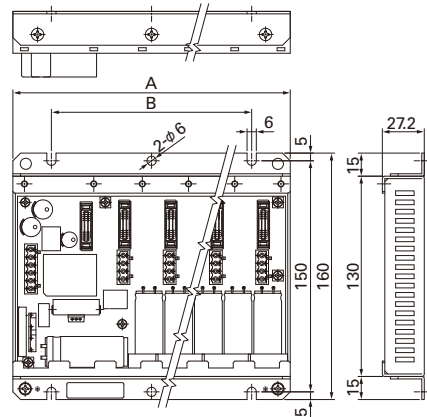


Power Unit

RRPAA00

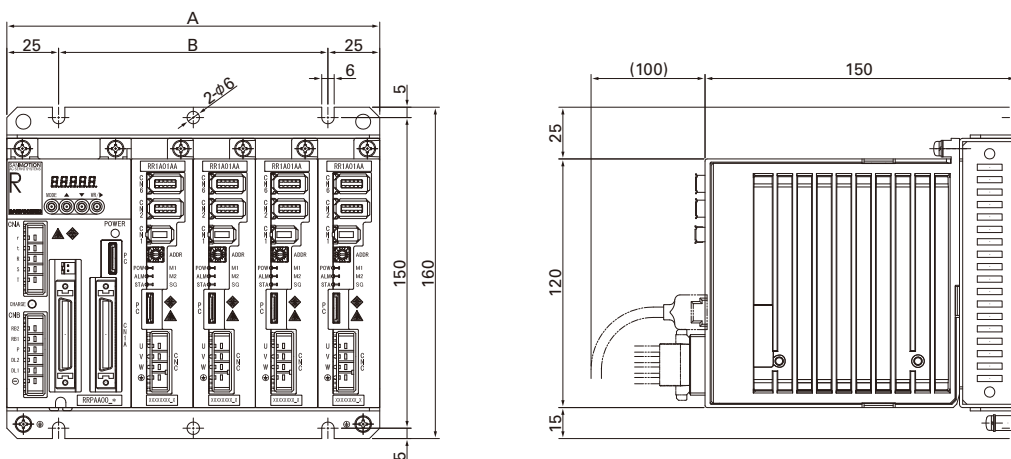


Motherboard



3	RRMA800	8	300	250
2	RRMA600	6	240	190
1	RRMA400	4	180	130
No.	Model No.	Number of Slots	Supported size	
			A	B

System Dimensions



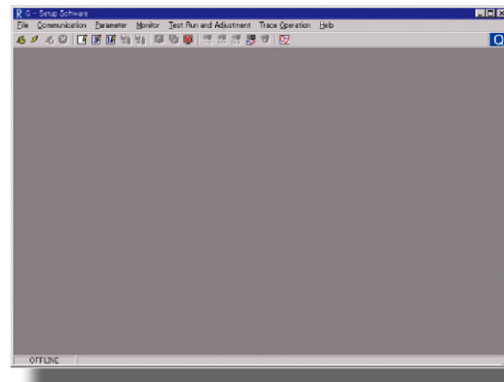
3	8	300	250
2	6	240	190
1	4	180	130
No.	Number of Slots	Supported size	
		A	B

Setup Software

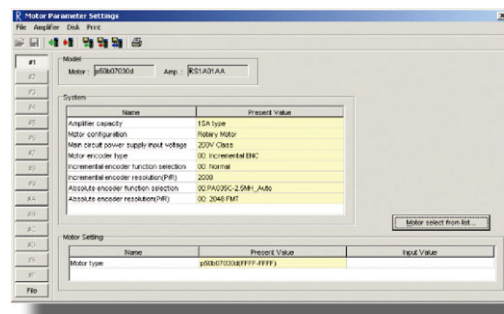
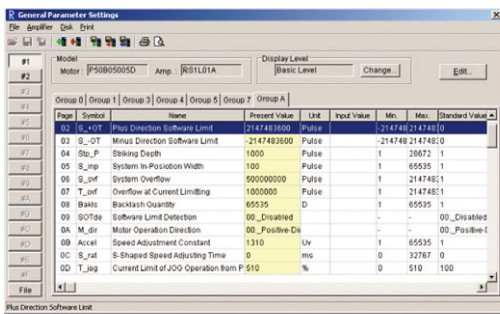
(1) Setup Software Start-up Screen



(2) Main Screen



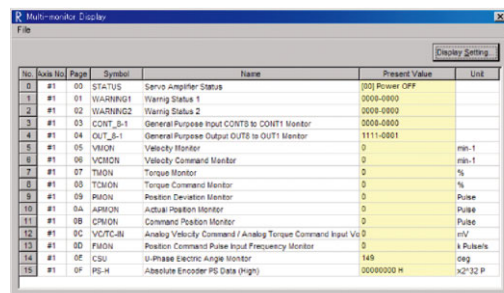
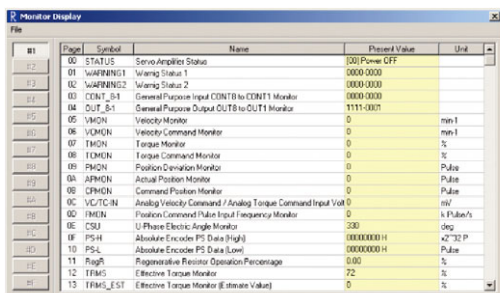
(3) Parameter Configuration Screen



a. Configuration of General Parameters : Enables parameter loading, saving, etc., via PC connection

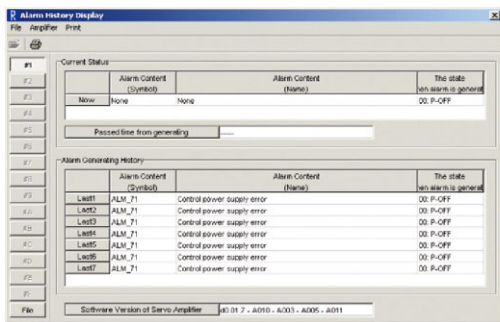
b. Configuration of Motor Parameters : Combined motors can be configured via PC connection

(4) Monitor Functions



a. Monitor Display : Observe Operation and Input/Output signal status

b. Multi-monitor Display : Simultaneous monitoring of operational status of multiple



c. Alarm Record Display : Current and past alarm occurrence can be checked.

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

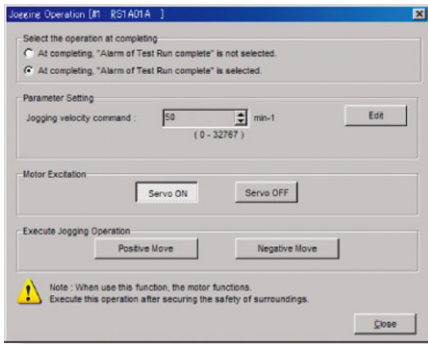
Dimensions

Setup Software

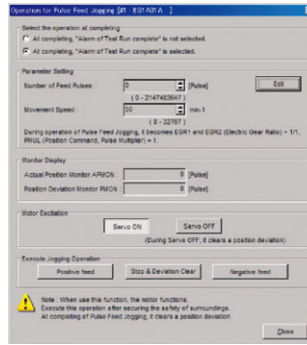
Optional Equipment

Setup Software

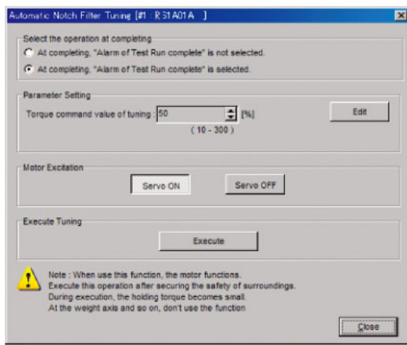
(5) Test Run and Adjustment Function



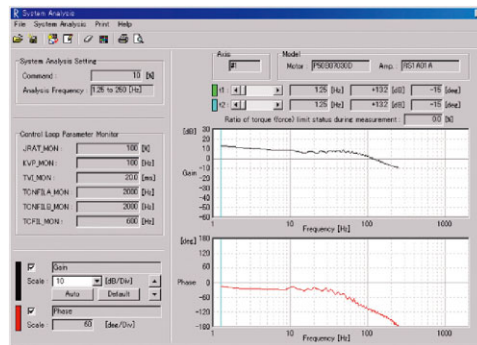
a. Speed Jog : Simplifies motor operation and the issuing of speed commands from a PC



b. Pulse Forward Jog : Simplifies motor operation and the entering of distance and travel speed data from a PC

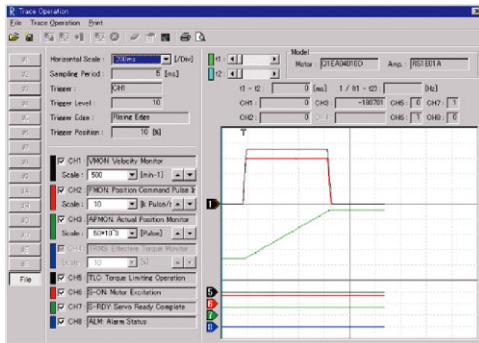


c. Auto Notch Filter Tuning : Configures the appropriate notch filter settings



d. System Analysis : Analyzes servo system frequency characteristics

(6) Operation Trace Function



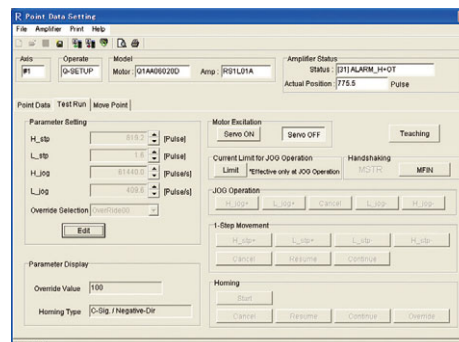
Graphically displays servo motor speed, current, and internal status

Built-in Positioning Function model Screen

Point Data Setup

No.	Feed Rate	Position	gpr_function	MODE1	MODE2	MODE3	MODE4	MODE5	MODE6	MODE7	MODE8	MODE9	MODE10	MODE11	MODE12	MODE13	MODE14	MODE15	MODE16	MODE17	MODE18	MODE19	MODE20
0	40.0	100.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	20.0	150.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	10.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Test Run



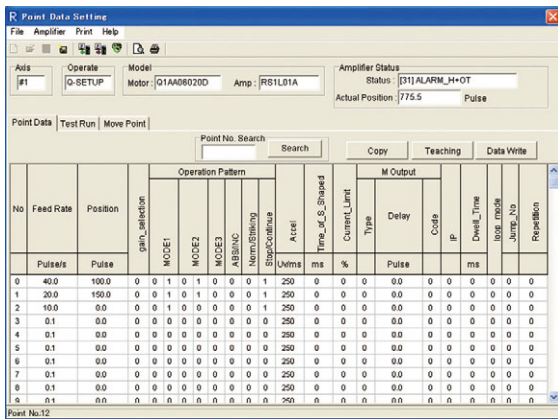
Servo Amplifier built-in positioning function

General Specifications

Positioning Function	Control Shaft Count	Single Shaft
	Register Point Count	Configurable up to 254 points (P000 to P253)
	Maximum No. of Commands	From -2,147,483,648 to +2,147,483,647
	Command Unit	Either mm or pulse is acceptable
	Fast-forward Speed	2,147,483.647mm/sec (0.001mm/when "pulse" is selected)
	Acceleration and Deceleration	Automatic acceleration and deceleration (straight and S switch)
	Point Data Setup	Numerical input via PC, and setup by teaching
	Travel Point Number Setup	Parallel 8 bits (binary code)
	Torque limit	0 to 510% (at 100% rating), but less than instantaneous maximum stall current
	Software Limit	Exists
Input and Output	Travel Mode	Zero Return, Manual (JOG, 1Step), and Point-specified Travel
	Zone Signal	Maximum of 8 zones
Input and Output	Sequence Input Signals	Servo ON, alarm reset, start up, zero return, manual, override/manual high-speed, cancel, deceleration before origin, external error, over-travel, external data setup1 step forward, interrupt activated, output selection, MFIN, point specified input
	Sequence Output Signals	NC ready, holding brake timing, error, external operation enabled, running, positioning completion, in-position output, zero return completion, general output (8 bits)

Sample operations of the Servo Amplifier built-in positioning function model

By starting up Point 1, Points 2 and 3 will be executed consecutively.



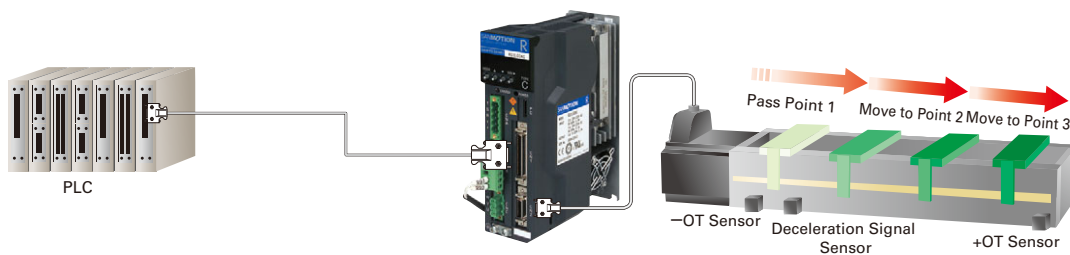
Point Data Setup

Enables configuration and saving of parameters, and the reading of point data from a PC.

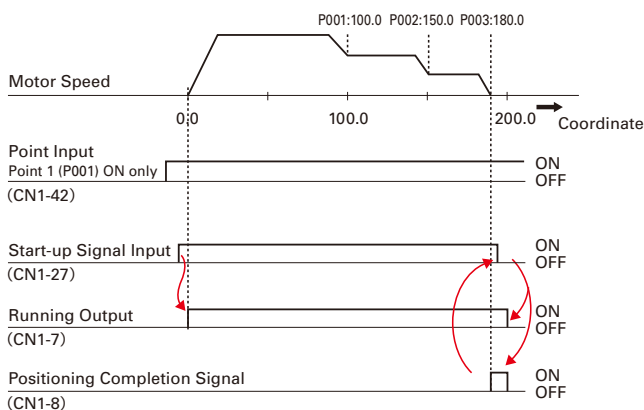
Mode 1: [01]= Positioning Operation enabled;

Mode 2: [00]= Final Travel, [01]= Continue to next Point Number

Gear Change: Stop / Continue: [1]= Consecutive Gear Shift Operation



Starting Coordinates: Start-up Point 001 (P001) as 0.0



Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

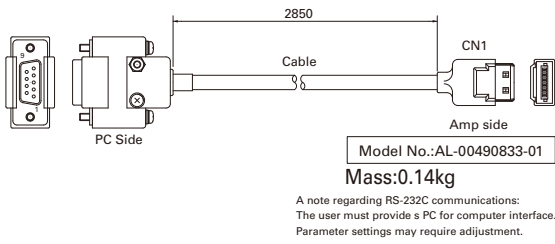
Dimensions

Setup Software

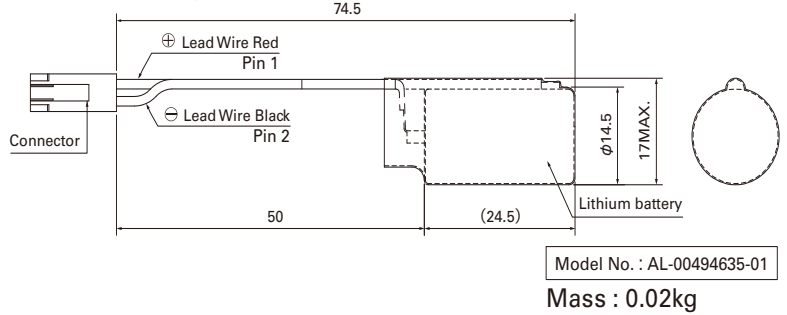
Optional Equipment

Optional Equipment

PC Interface Cable [Unit: mm]

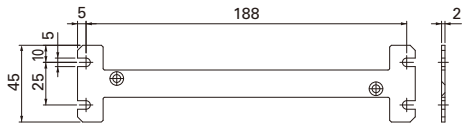


Lithium battery [Unit: mm]



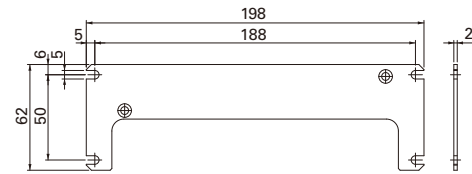
Mounting Hardware [Unit: mm] * Supported For only Single-axis amplifier.

15A / 30A Rear Side



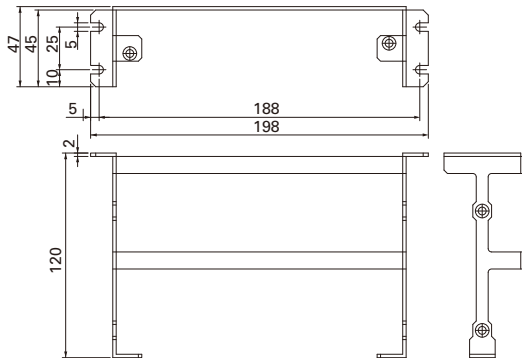
For mounting on the rear side of the amplifier
Model No.:AL-00582791-01
Applicable Amplifiers:RS1*01***
Applicable Amplifiers:RS1*03***
Material:SPCC

50A Rear Side



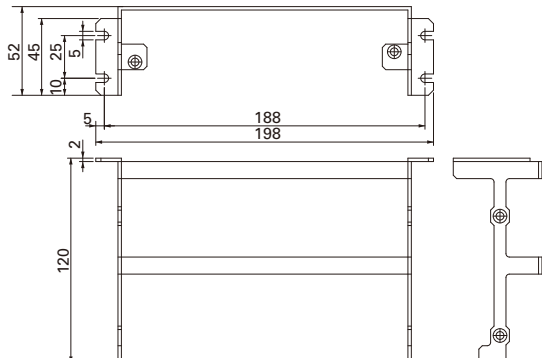
For mounting on the rear side of the amplifier
Model No.:AL-00582792-01
Applicable Amplifiers:RS1*05***
Material:SPCC

15A Front Side



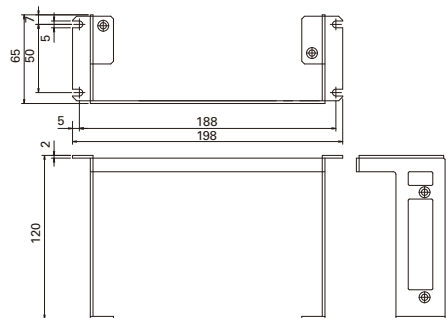
For mounting on the front side of the amplifier
Model No.:AL-00582788-01 Material:SPCC
Applicable Amplifiers:RS1*01***

30A Front Side



For mounting on the front side of the amplifier
Model No.:AL-00582789-01 Material:SPCC
Applicable Amplifiers:RS1*03***

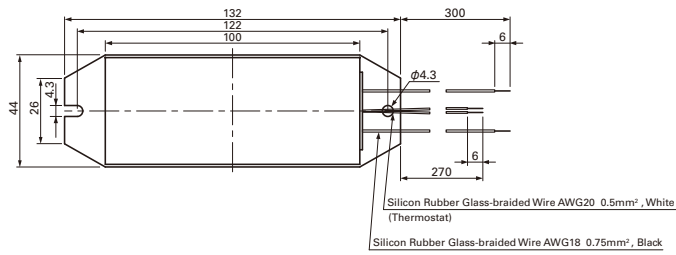
50A Front Side



For mounting on the front side of the amplifier
Model No.:AL-00582790-01 Material:SPCC
Applicable Amplifiers:RS1*05***

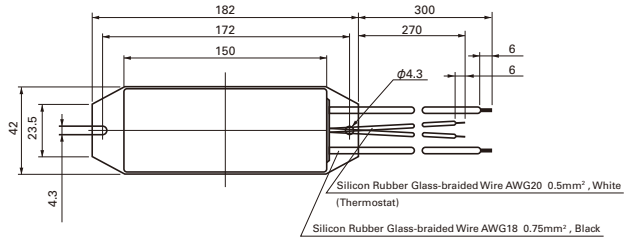
Model No.	AL-00582791-01	AL-00582792-01	AL-00582788-01	AL-00582789-01	AL-00582790-01
Contents	Mounting Bracket : 1 Screws : 2	Mounting Bracket : 1 Screws : 2	Mounting Bracket : 1 Screws : 6	Mounting Bracket : 1 Screws : 6	Mounting Bracket : 1 Screws : 6

External Regenerative Resistor Dimensions [Unit: mm]



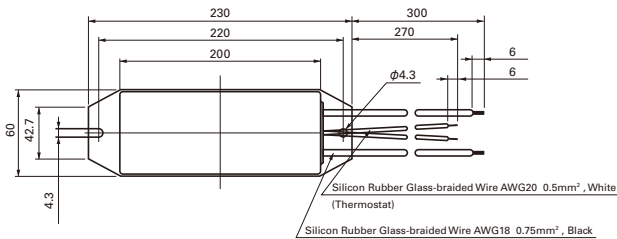
Mass : 0.19kg

	Model No.	Thermostat
1	REGIST-080W100B	Normal close
2	REGIST-080W50B	Normal close



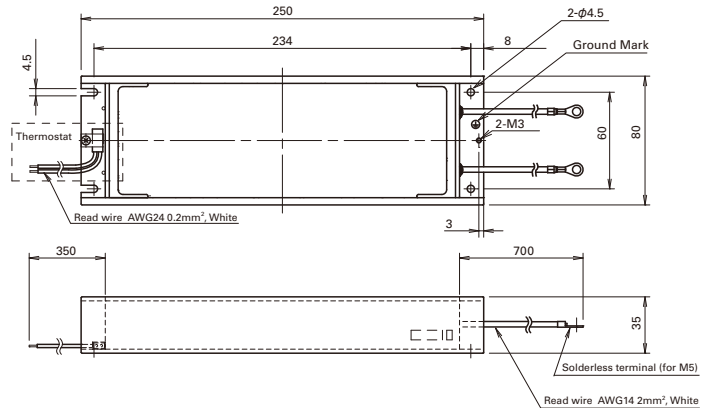
Mass : 0.24kg

	Model No.	Thermostat
1	REGIST-120W100B	Normal close
2	REGIST-120W50B	Normal close



Mass : 0.44kg

	Model No.	Thermostat
1	REGIST-220W20B	Normal close
2	REGIST-220W50B	Normal close
3	REGIST-220W100B	Normal close



Mass : 1.5kg

	Model No.	Thermostat
1	REGIST-500CW20B	Normal close
2	REGIST-500CW10B	Normal close

Connectors for Single-Axis Servo Amplifier Connections (200V AC Input Type)

Usage	Contents	Model No.	Manufacturer	Manufacturer's Part No.
Single Connectors	CN1 (Plug, Housing)	AL - 00385594	Sumitomo 3M	10150-3000PE+10350-52A0-008
	CN2 (Plug, Housing)	AL - 00385596		10120-3000PE+10320-52A0-008
	CNA (Plug)	AL - 00329461-01	Phoenix Contact	MSTB2.5/5-STF-5.08
	CNB (Plug) : Accessory	AL - Y0000988-01		IC2.5/6-STF-5.08
	CNC (Plug)	AL - 00329458-01		IC2.5/3-STF-5.08
Connector Sets	CN1,CN2 (Plug, Housing) CNA,CNC (Plug)	AL - 00393603	Sumitomo 3M Phoenix Contact	10150-3000PE+10350-52A0-008 10120-3000PE+10320-52A0-008 MSTB2.5/5-STF-5.08 IC2.5/3-STF-5.08
	CN1,CN2 (Plug, Housing)	AL - 00292309	Sumitomo 3M	10150-3000PE+10350-52A0-008 10120-3000PE+10320-52A0-008

Features and Functions

Model Number Nomenclature

System Configuration

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External Wiring Diagram

Dimensions

Setup Software

Optional Equipment

Optional Equipment

Connectors for Servo Amplifier with CANopen

① Main Power : 200V AC, Control Power : 1 φ 200V AC

	Contents	Model No.	Manufacturer	Manufacturer's Part No.
Single Connectors	CN1 (Plug, Housing)	AL - 00608710	Sumitomo 3M	10114-3000PE+10314-52A0-008
	CN2 (Plug, Housing)	AL - 00385596		10120-3000PE+10320-52A0-008
	CNA (Plug)	AL - 00329461-01	Phoenix Contact	MSTB2.5/5-STF-5.08
	CNB (Plug) : Accessory	AL - Y0000988-01		IC2.5/6-STF-5.08
	CNC (Plug)	AL - 00329458-01		IC2.5/3-STF-5.08
Connector Sets	CN1,CN2 (Plug, Housing) CNA,CNC (Plug)	AL - 00661731	Sumitomo 3M Phoenix Contact	10114-3000PE+10314-52A0-008 10120-3000PE+10320-52A0-008 MSTB2.5/6-STF-5.08 IC2.5/3-STF-5.08
	CN1,CN2 (Plug, Housing)	AL - 00661729	Sumitomo 3M	10114-3000PE+10314-52A0-008 10120-3000PE+10320-52A0-008

② Main Power : 200V AC, Control Power : 24V DC

	Contents	Model No.	Manufacturer	Manufacturer's Part No.
Single Connectors	CN1 (Plug, Housing)	AL - 00608710	Sumitomo 3M	10114-3000PE+10314-52A0-008
	CN2 (Plug, Housing)	AL - 00385596		10120-3000PE+10320-52A0-008
	CNA (Plug)	AL - Y0000988-02	Phoenix Contact	IC2.5/7-STF-5.08
	CNB (Plug)	AL - 00329460-01		MSTB2.5/2-STF-5.08
	CNC (Plug)	AL - 00329458-01		IC2.5/3-STF-5.08
Connector Sets	CN1,CN2 (Plug, Housing) CNA,CNB,CNC (Plug)	AL - 00667184	Sumitomo 3M Phoenix Contact	10114-3000PE+10314-52A0-008 10120-3000PE+10320-52A0-008 MSTB2.5/7-STF-5.08 MSTB2.5/2-STF-5.08 IC2.5/3-STF-5.08
	CN1,CN2 (Plug, Housing)	AL - 00661729	Sumitomo 3M	10114 - 3000PE+10314-52A0-008 10120 - 3000PE+10320-52A0-008

Connectors for Single-Axis Servo Amplifier Connections (100V AC Input Type)

	Contents	Model No.	Manufacturer	Manufacturer's Part No.
Single Connectors	CN1 (Plug, Housing)	AL - 00385594	Sumitomo 3M	10150-3000PE+10350-52A0-008
	CN2 (Plug, Housing)	AL - 00385596		10120-3000PE+10320-52A0-008
	CNA (Plug)	AL - 00329461-02	Phoenix Contact	MSTB2.5/4-STF-5.08
	CNB (Plug) : Accessory	AL - Y0000988-01		IC2.5/6-STF-5.08
	CNC (Plug)	AL - 00329458-01		IC2.5/3-STF-5.08
Connector Sets	CN1,CN2 (Plug, Housing) CNA,CNC (Plug)	AL - 00492384	Sumitomo 3M Phoenix Contact	10150-3000PE+10350-52A0-008 10120-3000PE+10320-52A0-008 MSTB2.5/4-STF-5.08 IC2.5/3-STF-5.08
	CN1,CN2 (Plug, Housing)	AL - 00292309	Sumitomo 3M	10150-3000PE+10350-52A0-008 10120-3000PE+10320-52A0-008

Connectors for single-axis servo amplifier built-in positioning function serial interface model

	Contents	Model No.	Manufacturer	Manufacturer's Part No.
Single Connectors	CN1 (Plug, Housing)	AL-Y0004290-02	J.S.T.Mfg.CO.,LTD	MUF-PK10K-X

CN2, CNA, CNB, and CNC are the same as the connectors for the Servo Amplifier built-in positioning function model above.

Connectors for Multi-Axis Servo Amplifier Connections

	Contents	Model No.	Manufacturer	Manufacturer's Part No.	
Single Connectors	Amplifier Unit	CN1 (Plug, Housing)	Molex	55100-0670	
		CN2 (Plug, Housing)	Sumitomo 3M	36310-3200-008	
		CN6 (Plug, Housing)		36210-0100PL	
		CNC (Plug)	AL - 00632604	J.S.T.Mfg.CO.,LTD	04JFAT-SBXGF-I J-FATOT
	CNA (Plug)	AL - 00632600	05JFAT-SBXGF-I J-FATOT		
	CNB (Plug) : Accessory	AL - 00632602	06JFAT-SBXGF-I J-FATOT		
	Power Unit	CN1A (Plug, Housing)	AL - 00385594	Sumitomo 3M	10150-3000PE
CN1B (Plug, Housing)		10350-52A0-008			
Connector Sets	Amplifier Unit	CN1,CN2 (Plug, Housing) CN6,CNC (Plug)	AL - 00632611	J.S.T.Mfg.CO.,LTD	04JFAT-SBXGF-I
				Molex	55100-0670
				Sumitomo 3M	36310-3200-008 36210-0100PL
	Power Unit	CNA (Plug) CN1A,CN1B (Plug, Housing)	AL - 00632609	Sumitomo 3M J.S.T.Mfg.CO.,LTD	10150-3000PE 10350-52A0-008 05JFAT-SBXGF-I

Discontinued Models and Replacement Models

Models discontinued in this catalog and replacement models are listed below.
Please contact us for a catalog of replacement models.

Servo amplifier

Type	Discontinued model		Replacement model		Encoder type	
	Power	Model No.	Model No.	Motor encoder	External motor encoder	
Single-Axis Servo Amplifier (Analog/Pulse input type)	AC200V System	RS1A01AA	RS2A01A0AL0	Serial encoder	—	
			RS2A01A2AL0	Serial encoder	Pulse encoder	
			RS2A01A8AL0	Pulse encoder	—	
		RS1A03AA	RS2A03A0AL0	Serial encoder	—	
			RS2A03A2AL0	Serial encoder	Pulse encoder	
			RS2A03A8AL0	Pulse encoder	—	
		RS1A05AA	RS2A05A0AA0	Serial encoder	—	
			RS2A05A2AA0	Serial encoder	Pulse encoder	
			RS2A05A8AA0	Pulse encoder	—	
		RS1L01AA	RS2A01A0AA0	Serial encoder	—	
			RS2A01A2AA0	Serial encoder	Pulse encoder	
			RS2A01A8AA0	Pulse encoder	—	
		RS1L03AA	RS2A03A0AA0	Serial encoder	—	
			RS2A03A2AA0	Serial encoder	Pulse encoder	
			RS2A03A8AA0	Pulse encoder	—	
		RS1L05AA	RS2A05A0AL0	Serial encoder	—	
			RS2A05A2AL0	Serial encoder	Pulse encoder	
			RS2A05A8AL0	Pulse encoder	—	
		RS1A01AB	RS2A01A0BL0	Serial encoder	—	
			RS2A01A2BL0	Serial encoder	Pulse encoder	
			RS2A01A8BL0	Pulse encoder	—	
		RS1A03AB	RS2A03A0BL0	Serial encoder	—	
			RS2A03A2BL0	Serial encoder	Pulse encoder	
			RS2A03A8BL0	Pulse encoder	—	
		RS1A05AB	RS2A05A0BA0	Serial encoder	—	
			RS2A05A2BA0	Serial encoder	Pulse encoder	
			RS2A05A8BA0	Pulse encoder	—	
		RS1L01AB	RS2A01A0BA0	Serial encoder	—	
			RS2A01A2BA0	Serial encoder	Pulse encoder	
			RS2A01A8BA0	Pulse encoder	—	
		RS1L03AB	RS2A03A0BA0	Serial encoder	—	
			RS2A03A2BA0	Serial encoder	Pulse encoder	
			RS2A03A8BA0	Pulse encoder	—	
		RS1L05AB	RS2A05A0BL0	Serial encoder	—	
			RS2A05A2BL0	Serial encoder	Pulse encoder	
			RS2A05A8BL0	Pulse encoder	—	
		RS1A01AT	RS2A01AAAL0	Pulse encoder	Pulse encoder	
			RS2A03AAAL0	Pulse encoder	Pulse encoder	
			RS2A05AAAL0	Pulse encoder	Pulse encoder	
		RS1A03AT	RS2A03AAAA0	Pulse encoder	Pulse encoder	
			RS2A01AAAA0	Pulse encoder	Pulse encoder	
			RS2A03AAAA0	Pulse encoder	Pulse encoder	
RS1L01AT	RS2A01AAAA0	Pulse encoder	Pulse encoder			
	RS2A03AAAA0	Pulse encoder	Pulse encoder			
	RS2A05AAAA0	Pulse encoder	Pulse encoder			
RS1L03AT	RS2A03AAAA0	Pulse encoder	Pulse encoder			
	RS2A05AAAA0	Pulse encoder	Pulse encoder			
	RS2A01AAAA0	Pulse encoder	Pulse encoder			
RS1L05AT	RS2A05AAAA0	Pulse encoder	Pulse encoder			
	RS2E01A0AA0	Serial encoder	—			
	RS2E01A2AA0	Serial encoder	Pulse encoder			
RS1N01AA	RS2E01A8AA0	Pulse encoder	—			
	RS2E03A0AA0	Serial encoder	—			
	RS2E03A2AA0	Serial encoder	Pulse encoder			
RS1N03AA	RS2E03A8AA0	Pulse encoder	—			
	RS2E01A0AL0	Serial encoder	—			
	RS2E01A2AL0	Serial encoder	Pulse encoder			
RS1E01AA	RS2E01A8AL0	Pulse encoder	—			
	RS2E03A0AL0	Serial encoder	—			
	RS2E03A2AL0	Serial encoder	Pulse encoder			
RS1E03AA	RS2E03A8AL0	Pulse encoder	—			
	RS2E01A0BA0	Serial encoder	—			
	RS2E01A2BA0	Serial encoder	Pulse encoder			
RS1N01AB	RS2E01A8BA0	Pulse encoder	—			
	RS2E03A0BA0	Serial encoder	—			
	RS2E03A2BA0	Serial encoder	Pulse encoder			
RS1N03AB	RS2E03A8BA0	Pulse encoder	—			
	RS2E01A0BL0	Serial encoder	—			
	RS2E01A2BL0	Serial encoder	Pulse encoder			
RS1E01AB	RS2E01A8BL0	Pulse encoder	—			
	RS2E03A0BL0	Serial encoder	—			
	RS2E03A2BL0	Serial encoder	Pulse encoder			
RS1E03AB	RS2E03A8BL0	Pulse encoder	—			
	RS2E01AAAA0	Pulse encoder	Pulse encoder			
	RS2E03AAAA0	Pulse encoder	Pulse encoder			
RS1N01AT	RS2E01AAAL0	Pulse encoder	Pulse encoder			
	RS2E03AAAL0	Pulse encoder	Pulse encoder			
	RS2E01AAAL0	Pulse encoder	Pulse encoder			
RS1N03AT	RS2E03AAAL0	Pulse encoder	Pulse encoder			
	RS2E01AAAL0	Pulse encoder	Pulse encoder			
	RS2E03AAAL0	Pulse encoder	Pulse encoder			

* The discontinued products have the same hardware regardless of the motor encoder or external encoder of the combination motor, but the replacement products have different product model numbers depending on the motor encoder or external encoder of the combination motor.

Features and Functions
Model Number Nomenclature
System Configuration
Standard Specifications
External Wiring Diagram
Dimensions
Setup Software
Optional Equipment

Inquiry Check Sheet

For more information regarding any products or services described here in, please contact your nearest office listed on the back of this catalog.

To SANYO DENKI Co.,LTD.

Date : _____

Company: _____

Department: _____

Name: _____

Tel: _____

FAX: _____

E-mail: _____

Item	Contents																																																																																																
①	Name of target equipment Equipment name, category (transport, processing, test, other)																																																																																																
②	Name of servo axis Axis name, axial mechanism (horizontal/vertical), brake mechanism (yes/no)																																																																																																
③	Current condition of above axis Manufacturer Name () Series Name () Motor Capacity () Hydraulic, Mechanical, or New System ()																																																																																																
④	Positioning accuracy \pm mm $\cdot\pm$ μ m																																																																																																
⑤	Operation pattern <div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p style="font-size: small;">Feeding Speed [m/sec] vs Time [sec]. Acceleration α: ___ G · ___ [m/s²] Feeding Speed V: ___ [m/s] Moving Distance D: ___ [m] (Stroke) Time intervals: t_1 (acceleration), t_2 (constant speed), t_3 (deceleration)</p> </div> <div style="flex: 1; font-size: x-small; padding-left: 10px;"> <p>[Reference formula] $1G=9.8[m/s^2]$, $1[m/s^2]=0.1G$ $\alpha[m/s^2]=V[m/sec]\div t_1[sec]$ $D[m]=V[m/sec]\times(t_1+t_2)[sec]$</p> </div> </div>																																																																																																
⑥	Mechanism Ball-screw/screw-rotation type (horizontal/vertical), ball-screw/nut-rotation type (horizontal/vertical), rack and pinion (horizontal/vertical), belt/chain (horizontal/vertical), rotary table, roll feed, other																																																																																																
⑦	Mechanical structure <table style="width: 100%; font-size: x-small; border-collapse: collapse;"> <tr> <td>WT(table mass)</td><td>kg</td> <td>WL(work mass)</td><td>kg</td> <td>WA(mass of other drive parts)</td><td>kg</td> </tr> <tr> <td>WR(rack mass)</td><td>kg</td> <td>WB(belt/chain mass)</td><td>kg</td> <td>WC(counterbalance mass)</td><td>kg</td> </tr> <tr> <td>Fa(external force axial direction)</td><td>N</td> <td>Fb(ball-screw preload)</td><td>N</td> <td>T(roll pushing force)</td><td>N</td> </tr> <tr> <td>Dr1(drive-side roll diameter)</td><td>mm</td> <td>Dr2(follower-side roll diameter)</td><td>mm</td> <td></td><td></td> </tr> <tr> <td>Lr1(drive-side roll length)</td><td>mm</td> <td>Lr2(follower-side roll length)</td><td>mm</td> <td>G(reduction ratio)</td><td></td> </tr> <tr> <td>JG(speed-reducer inertia)</td><td>kg·m²</td> <td>JC(coupling inertia)</td><td>kg·m²</td> <td></td><td></td> </tr> <tr> <td>JN(nut inertia)</td><td>kg·m²</td> <td>JO(other motor-axis conversion inertia)</td><td>kg·m²</td> <td></td><td></td> </tr> <tr> <td>Db(ball-screw diameter)</td><td>mm</td> <td>Lb(ball-screw axial length)</td><td>mm</td> <td>Pb(ball-screw lead)</td><td>mm</td> </tr> <tr> <td>Dp(pinion/pulley diameter)</td><td>mm</td> <td>Lp(pinion axial length)</td><td>mm</td> <td>tp(pully thickness)</td><td>mm</td> </tr> <tr> <td>Dt(table diameter)</td><td>mm</td> <td>Dh(table-support diameter)</td><td>mm</td> <td>LW(load shift from axis)</td><td>mm</td> </tr> <tr> <td>Ds(table shaft diameter)</td><td>mm</td> <td>Ls(table shaft length)</td><td>mm</td> <td></td><td></td> </tr> <tr> <td>ρ(specific gravity of ball-screw/pinion/pulley/table-shaft material)</td><td>kg·cm³</td> <td></td><td></td> <td></td><td></td> </tr> <tr> <td>μ(friction coefficient between sheet and shilding-surface/support-section/roll)</td><td></td> <td>ρ_1(specific gravity of roll-1 material)</td><td>kg/cm³</td> <td></td><td></td> </tr> <tr> <td>ρ_2(specific gravity of roll-2 material)</td><td>kg/cm³</td> <td>κ(internal friction coefficient of preload nut)</td><td></td> <td></td><td></td> </tr> <tr> <td>η(mechanical efficiency)</td><td></td> <td>JL(load inertia of motor-axis conversion)</td><td>kg·m²</td> <td></td><td></td> </tr> <tr> <td>TF(friction torque of motor axis conversion)</td><td>N·m</td> <td>Tu(imbalance torque of motor axis conversion)</td><td>N·m</td> <td></td><td></td> </tr> </table>	WT(table mass)	kg	WL(work mass)	kg	WA(mass of other drive parts)	kg	WR(rack mass)	kg	WB(belt/chain mass)	kg	WC(counterbalance mass)	kg	Fa(external force axial direction)	N	Fb(ball-screw preload)	N	T(roll pushing force)	N	Dr1(drive-side roll diameter)	mm	Dr2(follower-side roll diameter)	mm			Lr1(drive-side roll length)	mm	Lr2(follower-side roll length)	mm	G(reduction ratio)		JG(speed-reducer inertia)	kg·m ²	JC(coupling inertia)	kg·m ²			JN(nut inertia)	kg·m ²	JO(other motor-axis conversion inertia)	kg·m ²			Db(ball-screw diameter)	mm	Lb(ball-screw axial length)	mm	Pb(ball-screw lead)	mm	Dp(pinion/pulley diameter)	mm	Lp(pinion axial length)	mm	tp(pully thickness)	mm	Dt(table diameter)	mm	Dh(table-support diameter)	mm	LW(load shift from axis)	mm	Ds(table shaft diameter)	mm	Ls(table shaft length)	mm			ρ (specific gravity of ball-screw/pinion/pulley/table-shaft material)	kg·cm ³					μ (friction coefficient between sheet and shilding-surface/support-section/roll)		ρ_1 (specific gravity of roll-1 material)	kg/cm ³			ρ_2 (specific gravity of roll-2 material)	kg/cm ³	κ (internal friction coefficient of preload nut)				η (mechanical efficiency)		JL(load inertia of motor-axis conversion)	kg·m ²			TF(friction torque of motor axis conversion)	N·m	Tu(imbalance torque of motor axis conversion)	N·m		
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⑧	Speed reducer Customer-provided (/)·Sanyo denki standard(planet/spur/no-backlash-planet /) other(/)																																																																																																
⑨	Encoder type Encoder type specified (yes / no) Yes:(Wiring saving incremental encoder, battery backup absolute encoder, absolute encoder for incremental system, battery-less absolute encoder) Resolution()																																																																																																
⑩	Input format Position , velocity , torque , other ()																																																																																																
⑪	Host equipment (controller) Sequencer , laptop , customer-developed product , Sanyo dennki-provided , other ()																																																																																																
⑫	Usage environment and other requirements Cutting , clean-room use , anti-dust measures , other ()																																																																																																
⑬	Estimated production Single product: () units/month () units/year																																																																																																
⑭	Development schedule Prototype period: ()Year () Month Production period: ()Year () Month																																																																																																
⑮	Various measures Related documentation (already submitted; send later by mail) Visit/PR desired (yes / no) Meeting desired (yes / no)																																																																																																
⑯	Miscellaneous (questions, pending problems, unresolved issues, etc.)																																																																																																

■ ECO PRODUCTS



ECO PRODUCTS are designed with the goal of lessening nevironmental impact, from product development to disposal.

■ Precautions For Adoption



Failure to follow the precautions on the right may cause moderate injury and property damage, or in some circumstances, could lead to a serious accident. Always follow all listed precautions.

⚠ Cautions

- Read the accompanying Instruction Manual carefully prior to using the product.
- If applying to medical devices and other equipment affecting people's lives, please contact us beforehand and take appropriate safety measures.
- If applying to equipment that can have significant effects on society and the general public, please contact us beforehand.
- Do not use this product in an environment where vibration is present, such as in a moving vehicle or shipping vessel.
- Do not perform any retrofitting, re-engineering, or modification to this equipment.
- The SERVO SYSTEMS presented in this catalog are meant to be used for general industrial applications. If using for special applications related to aviation and space, nuclear power, electric power, submarine repeaters, etc., please contact us beforehand.

*For any question or inquiry regarding the above, contact our Sales Department.

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