

SANMOTION



AC SERVO SYSTEMS

R



SANYO DENKI

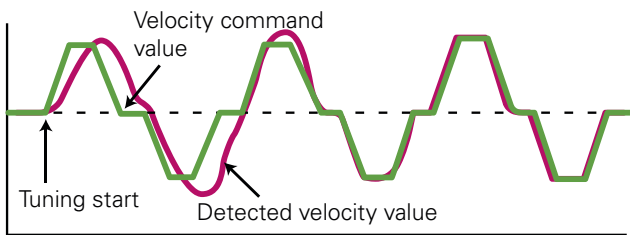
Ver.5

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

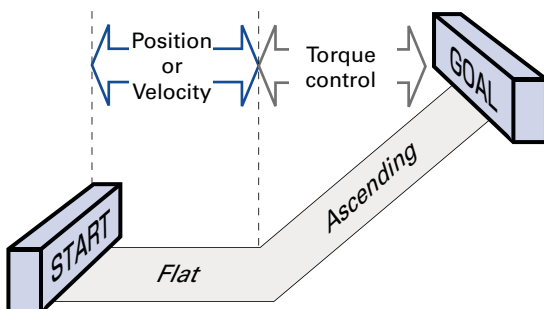
Protection code is IP67 for all models.



*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

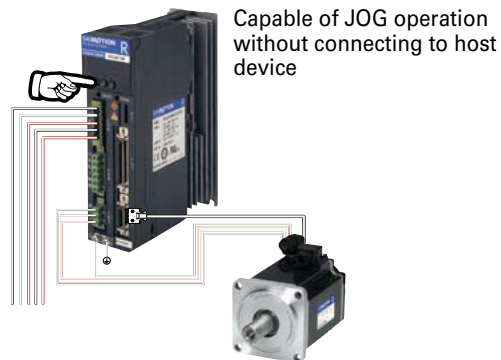
Parameter setting, monitoring and alarm tracing can be easily done using the built-in operator.



*Multi-axis is done through a personal computer.

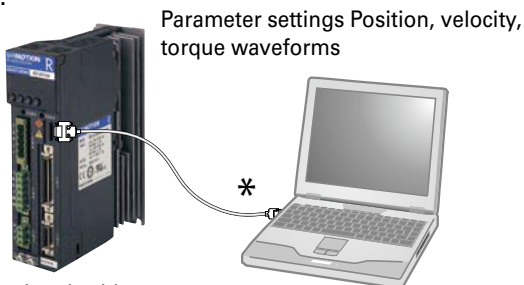
Test Function (JOG)

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



Setup Software

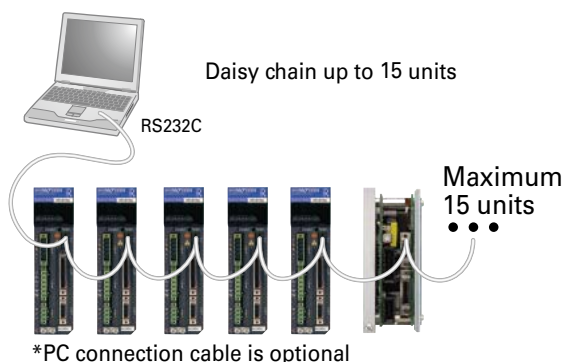
The setup software allows you to set parameters, view graphical displays of monitored position, velocity or torque waveforms, and perform system analysis.



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

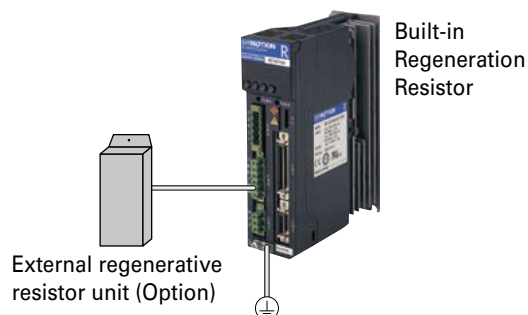
Multiaxial Monitor Function

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



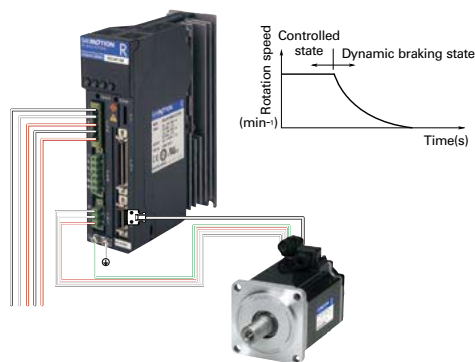
Built-in Regeneration Resistor

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.

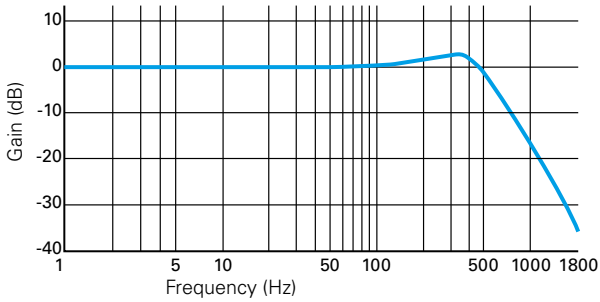


CONCEPT
2

Improved Precision and Reduced Cycle Time

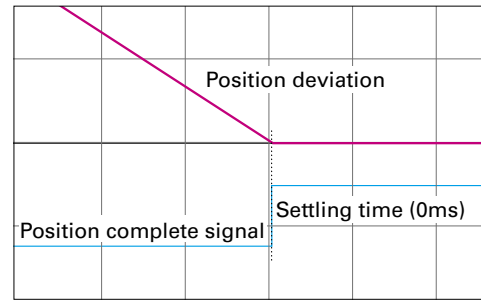
High Response

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



Shorter Position Settling Time

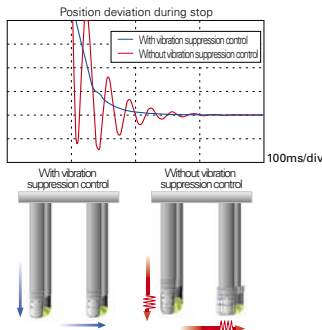
A new algorithm drastically shortens positioning settling time for equipment.



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

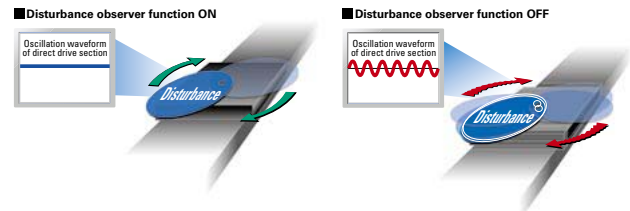
Vibration Suppression Control

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.



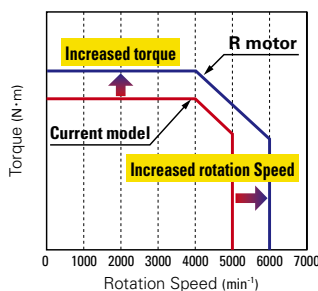
Disturbance Suppression

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



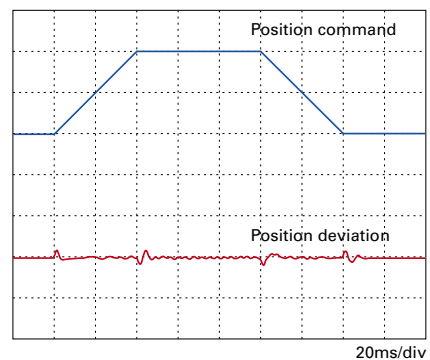
Expanded Power Range

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.



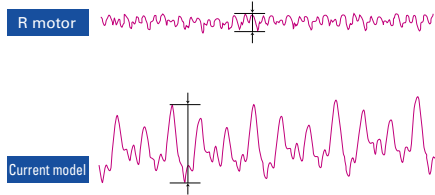
CONCEPT
3

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.

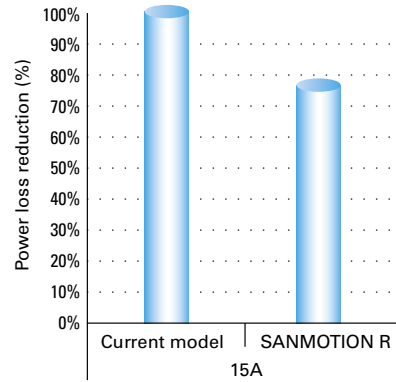
Comparison of cogging torque waveforms



(*Image)

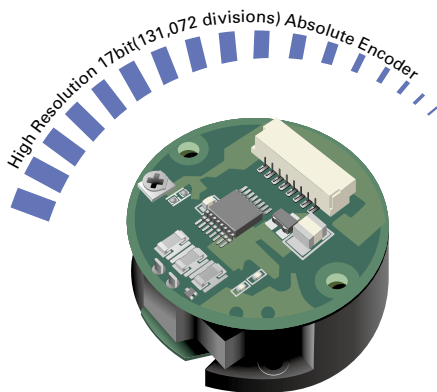
20% Reduction in Power Loss

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



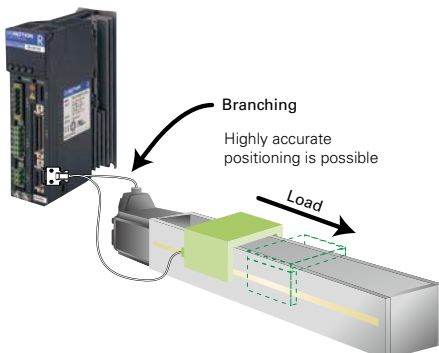
High Resolution

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



Full Closed-Loop Control

Optional support for full closed-loop control using linear scale and other high resolution encoders mounted on device side.



*available for single-axis only

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
				—	—	R2AA06010FXP00
				—	Standard	R2AA06010FXP00M
			60mm sq.	—	—	R2AA06010FCP00
				yes (24V)	—	R2AA06010FCP00
				yes (24V)	Standard	R2AA06010FCP00M
				—	—	R2AA06020FXP00
		200W	60mm sq.	—	—	R2AA06020FXP00M
				yes (24V)	—	R2AA06020FCP00
				yes (24V)	Standard	R2AA06020FCP00M
				—	—	R2AA08020FXP00
			80mm sq.	—	—	R2AA08020FXP00M
				yes (24V)	—	R2AA08020FCP00
		yes (24V)		Standard	R2AA08020FCP00M	
		—		—	R2AA06040FXP00	
		400W	60mm sq.	—	—	R2AA06040FXP00M
				—	Standard	R2AA08040FXP00
				—	—	R2AA08040FXP00M
				yes (24V)	—	R2AA08040FCP00
			80mm sq.	yes (24V)	Standard	R2AA08040FCP00M
				—	—	R2AA08075FXP00
	750W	80mm sq.	—	Standard	R2AA08075FXP00M	
			yes (24V)	—	R2AA08075FCP00	
			yes (24V)	Standard	R2AA08075FCP00M	
			—	—	R2AA08075FXP00	
	1000W	86mm sq.	—	—	R2AAB8100FXP00	
			—	Standard	R2AAB8100FXP00M	
			yes (24V)	—	R2AAB8100FCP00	
			yes (24V)	Standard	R2AAB8100FCP00M	
		30W	40mm sq.	—	—	R2AA04003FXH00
				—	Standard	R2AA04003FXH00M
	30W	40mm sq.	yes (24V)	—	R2AA04003FCH00	
			yes (24V)	Standard	R2AA04003FCH00M	
			—	—	R2AA04005FXH00	
			—	Standard	R2AA04005FXH00M	
		50W	40mm sq.	yes (24V)	—	R2AA04005FCH00
				yes (24V)	Standard	R2AA04005FCH00M
	—			—	R2AA04010FXH00	
	—			Standard	R2AA04010FXH00M	
	100W	40mm sq.	—	—	R2AA06010FXH00	
			—	Standard	R2AA06010FXH00M	
			yes (24V)	—	R2AA06010FCH00	
			yes (24V)	Standard	R2AA06010FCH00M	
		60mm sq.	—	—	R2AA06020FXH00	
			—	Standard	R2AA06020FXH00M	
			yes (24V)	—	R2AA06020FCH00	
			yes (24V)	Standard	R2AA06020FCH00M	
	200W	60mm sq.	—	—	R2AA06020FXH00	
			—	Standard	R2AA06020FXH00M	
			yes (24V)	—	R2AA06020FCH00	
			yes (24V)	Standard	R2AA06020FCH00M	
80mm sq.		—	—	R2AA08020FXH00		
		—	Standard	R2AA08020FXH00M		
	yes (24V)	—	R2AA08020FCH00			
	yes (24V)	Standard	R2AA08020FCH00M			
400W	60mm sq.	—	—	R2AA06040FXH00		
		—	Standard	R2AA06040FXH00M		
		—	—	R2AA08040FXH00		
		—	Standard	R2AA08040FXH00M		
	80mm sq.	yes (24V)	—	R2AA08040FCH00		
		yes (24V)	Standard	R2AA08040FCH00M		
750W	80mm sq.	—	—	R2AA08075FXH00		
		—	Standard	R2AA08075FXH00M		
		yes (24V)	—	R2AA08075FCH00		
		yes (24V)	Standard	R2AA08075FCH00M		
1000W	86mm sq.	—	—	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.				
Analog/Pulse input type	AC200V System AC200 to 230V (3-phase)	AC200V System AC200 to 230V (1-phase)	Wire-saving incremental encoder, Battery backup method absolute encoder	NPN	—	15A	RS1A01AA				
						30A	RS1A03AA				
					With	50A	RS1A05AA				
						15A	RS1L01AA				
				PNP	—	30A	RS1L03AA				
						50A	RS1L05AA				
					With	15A	RS1A01AB				
						30A	RS1A03AB				
			Full Closed	NPN	—	15A	RS1A01AT				
						30A	RS1A03AT				
					With	50A	RS1A05AT				
						15A	RS1L01AT				
				PNP	—	30A	RS1L03AT				
						50A	RS1L05AT				
					With	15A	RS1A01AL				
						30A	RS1A03AL				
CANopen Interface specifications	AC200V System	AC200V System	Wire-saving incremental encoder, Battery backup method absolute encoder	NPN	—	15A	RS1J01AL				
		DC24V				30A	RS1J03AL				
					AC200V System	With	50A	RS1J05AL			
		DC24V					15A	RS1A01AU			
					PNP	—	30A	RS1A03AU			
		With					50A	RS1A05AU			
				DC24V		—	15A	RS1J01AU			
		30A					RS1J03AU				
		Built-in positioning function model		AC200V System		AC200V System	Wire-saving incremental encoder, Battery backup method absolute encoder	NPN	—	15A	RS1A01AC
										30A	RS1A03AC
					With				50A	RS1A05AC	
									15A	RS1L01AC	
—	30A	RS1L03AC									
	50A	RS1L05AC									

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.
Analog/Pulse input type	AC100V System	AC100V System	Wire-saving incremental encoder, Battery backup method absolute encoder	NPN	With	15A	RS1N01AA
						30A	RS1N03AA
					—	15A	RS1E01AA
				PNP	With	15A	RS1N01AB
						30A	RS1N03AB
					—	15A	RS1E01AB
			Full Closed	NPN	With	15A	RS1N01AT
						30A	RS1N03AT
					—	15A	RS1E01AT
				NPN	With	15A	RS1N01AC
						30A	RS1N03AC
					—	15A	RS1E01AC
CANopen Interface specifications	AC100V System	AC100V System	Wire-saving incremental encoder, Battery backup method absolute encoder	NPN	With	15A	RS1E01AC
						30A	RS1E03AC
					—	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

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

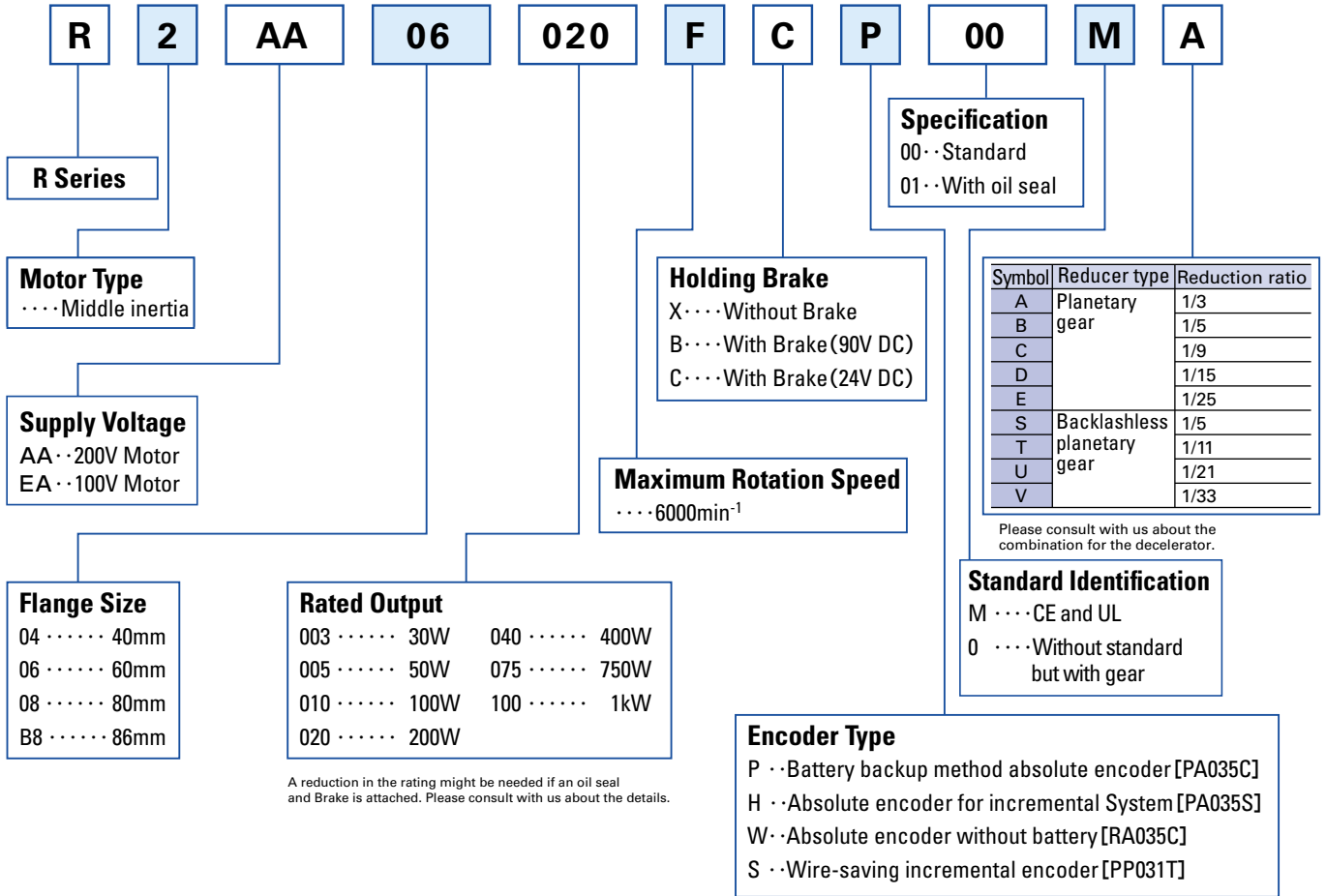
Setup Software

Optional Equipment

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

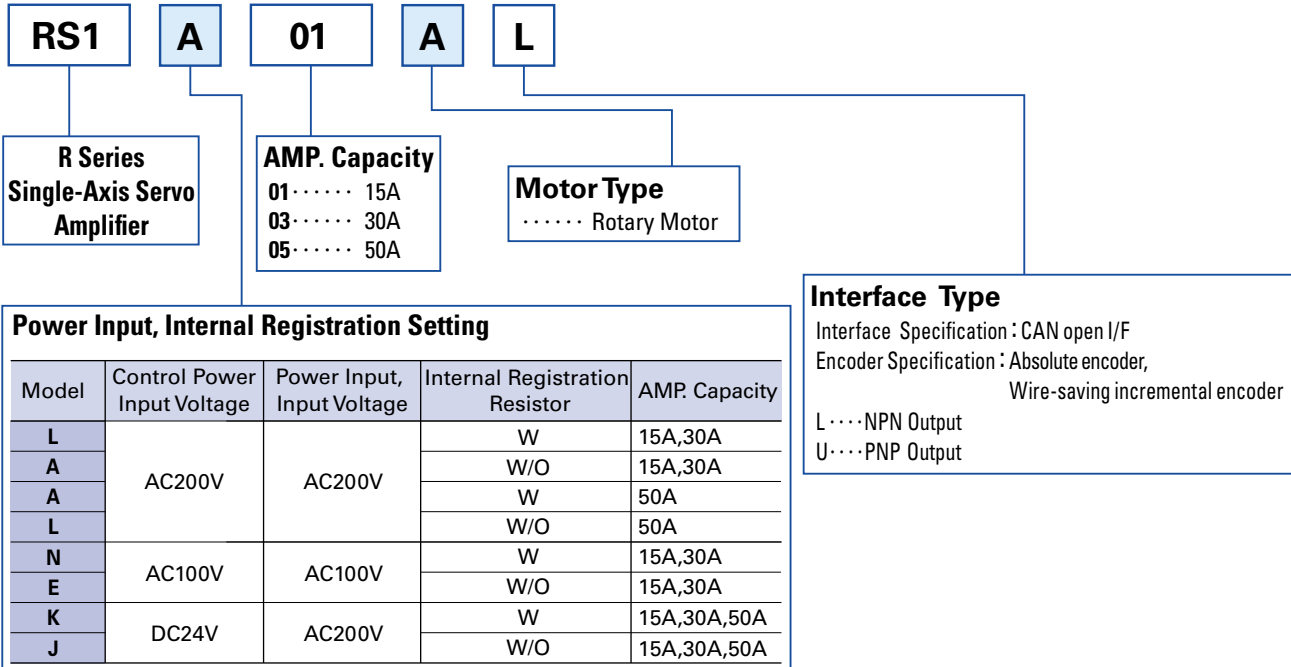
Our standard servo amplifier has attained the international standards (UL, c-UL and EN Standards).

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



Servo Amplifier with CANopen

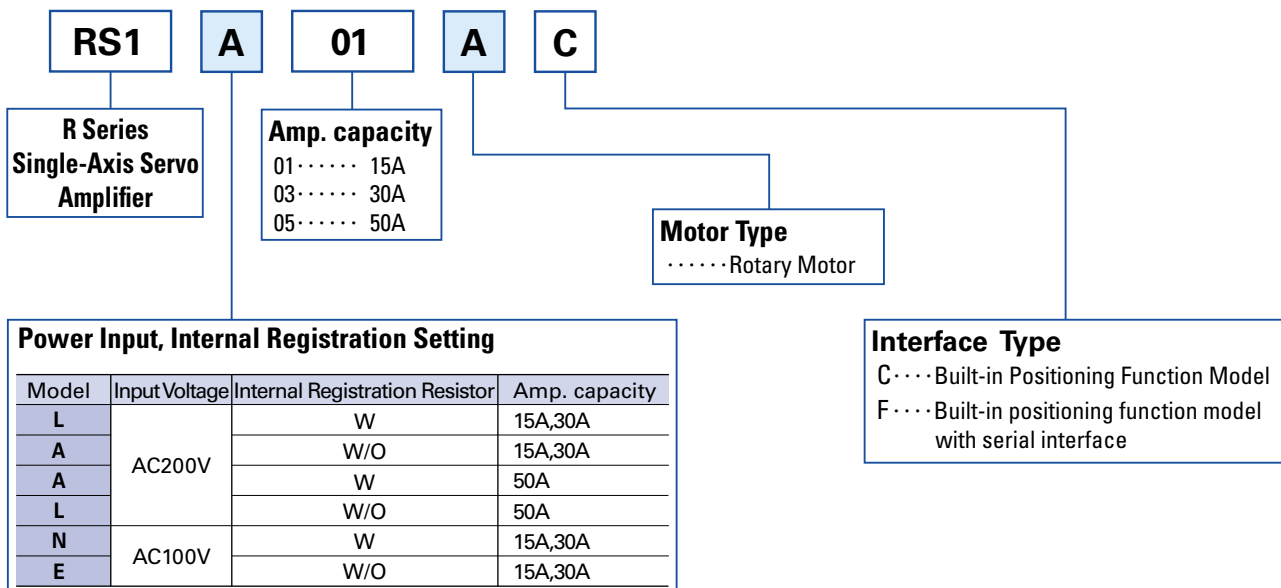
Example: The model number shown below is "R" Series Servo Amplifier with 200V AC input voltage (Main Power and Control Power) and 15A amplifier capacity.



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

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.



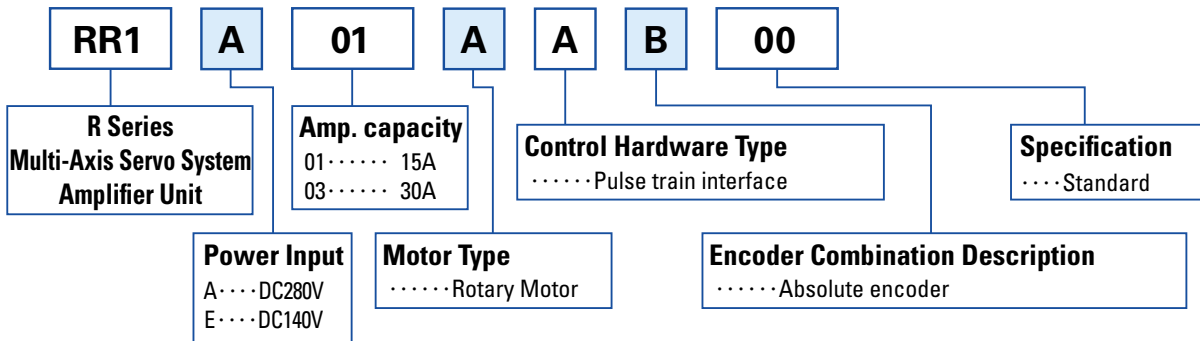
*The motor parameters need to be set for the amplifier for use. Use the setup software.

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.

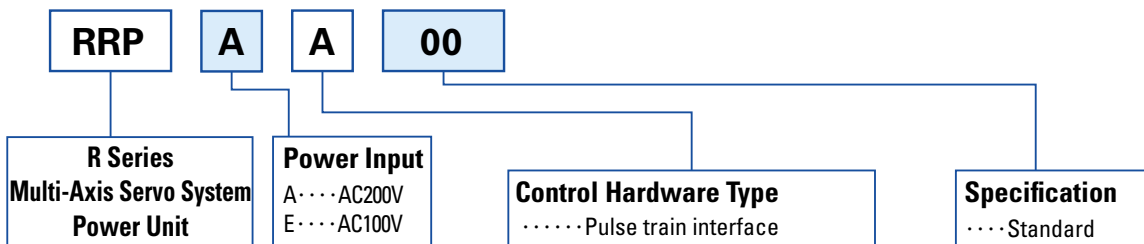
Amplifier Unit RR1A01AAB00 × 4 units
 Power Unit RRPAA00 × 1 unit
 Motherboard RRMA400 × 1 unit

Amplifier Unit

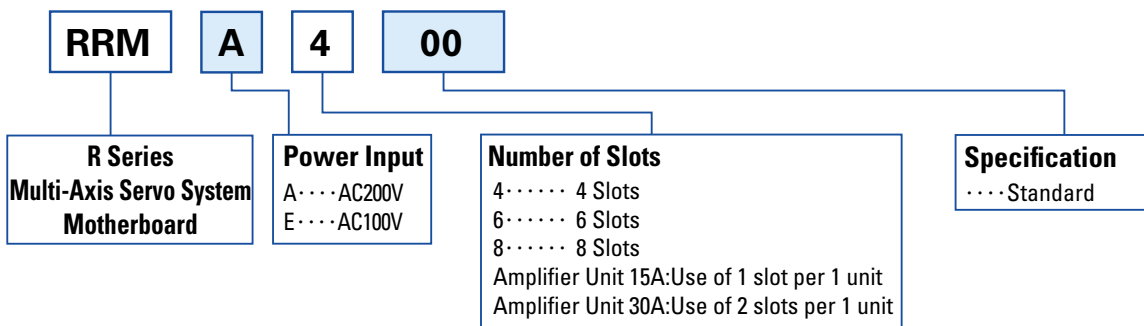


*The motor parameters need to be set for the amplifier for use. Use the setup software.

Power Unit



Motherboard



Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

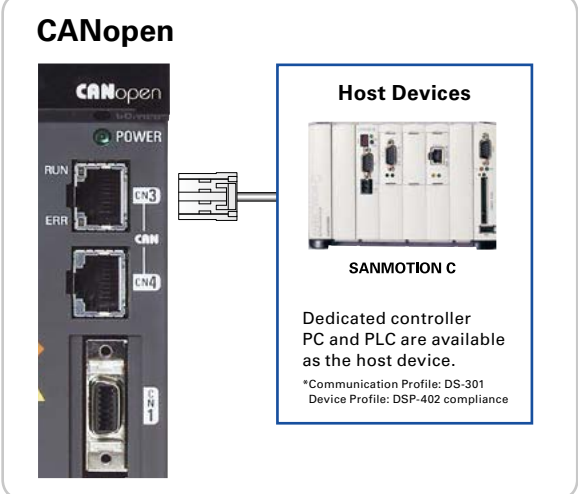
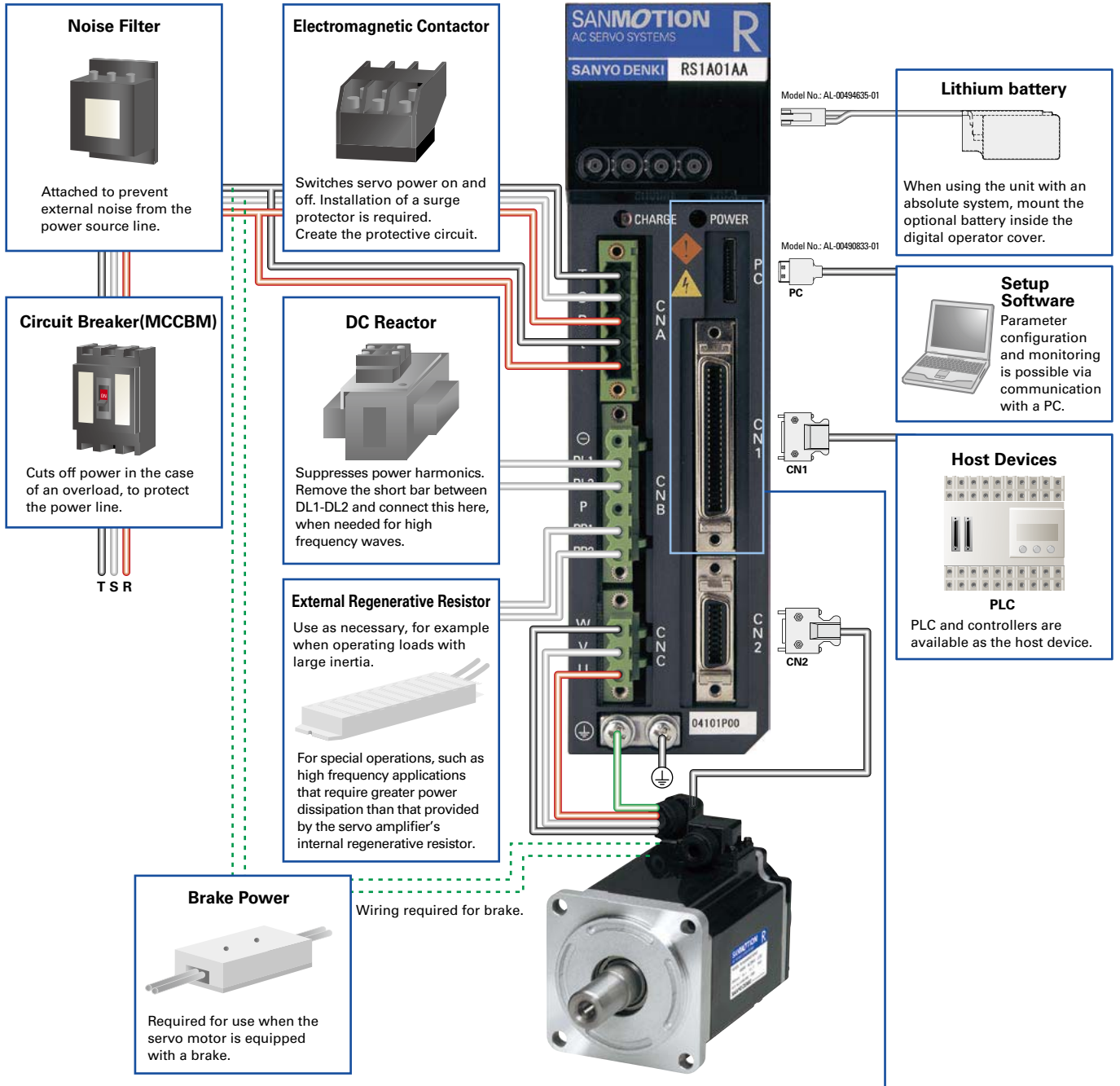
External Wiring Diagram

Dimensions

Setup Software

Optional Equipment

Single-Axis Servo Amplifier



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 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	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 _{εφ}	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	☆	te	ms	0.55	0.67	0.82
Mechanical Time Constant (Not including Encoder)	☆	tm	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	0.23	0.27	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	0.23		
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		
Power Consumption			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.

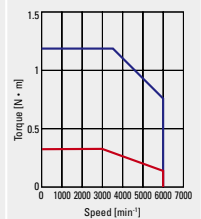
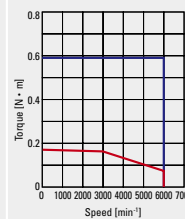
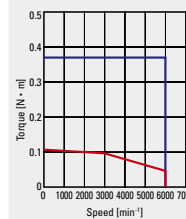
Note 3) This is an instance with the battery-backup method absolute encoder (PA035).

For the following encoders, please make inquiries:

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

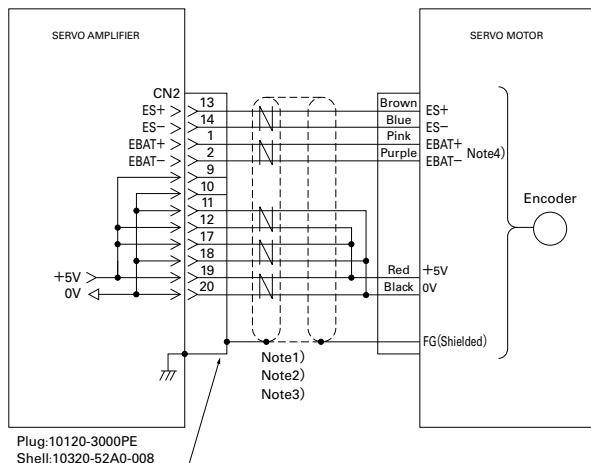
Note 4) The weight in the multi-axial specifications is of amplifier unit only.

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



Encoder Wiring Diagram

Single-Axis Servo Amplifier



Plug:10120-3000PE
Shell:10320-52A0-008

Battery backup type 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)	R2AAB8100F (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)						
0.59	0.84	1.3	1.2	1.6	2.6	3.5
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	
0.30	0.35		0.85		0.8	

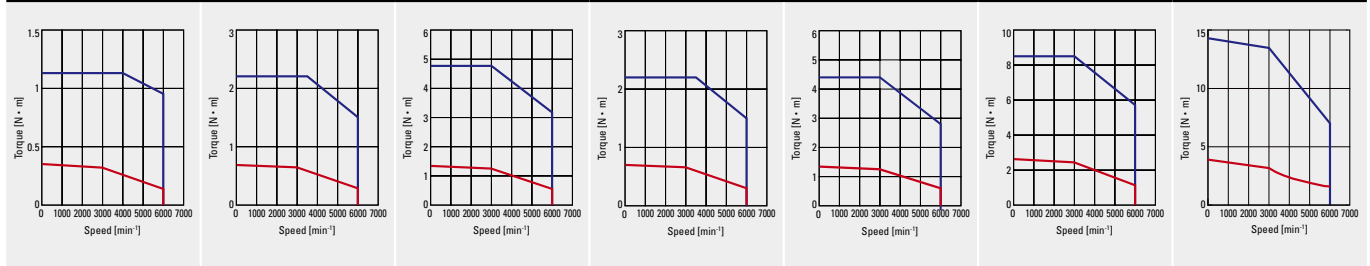
Operating Temperature: 0 to 40 °C, Relative Humidity: 90% Maximum, no condensation

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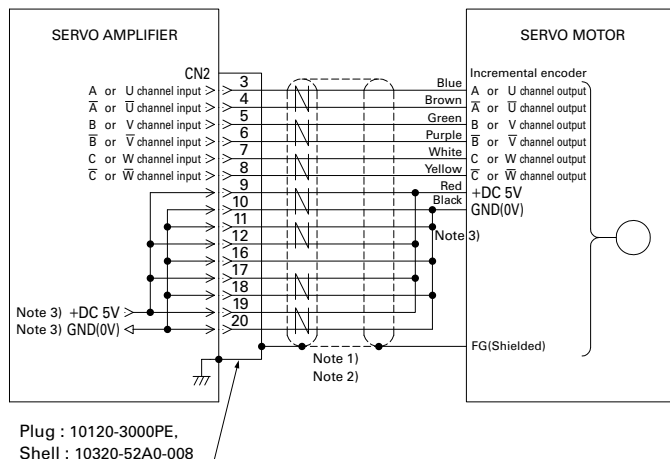
AC200V to 230V +10, -15% 50/60Hz ± 3Hz (Note 2)

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		0.9 / 1.0 / 0.48		1.0 / 1.1 / 0.77	
2.2 / 2.3 / —							



Single-Axis Servo Amplifier



Red. Wiring 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 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				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	0.23	0.27
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	0.23	
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	
Power Consumption			kVA	0.2	
Amplifier Mass (Weight) [Single / Multi]			kg	0.9 / 0.48	

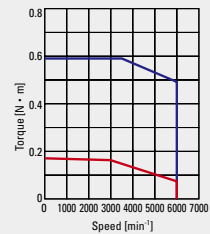
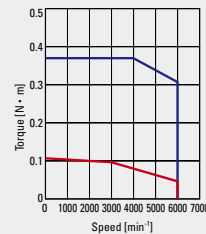
Note 1) The multi-axis type Servo amplifier has an ambient operating temperature of 0 to 40°C. The operating temperature with forced air cooling is 0 to 55°C.

Note 2) This is 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]

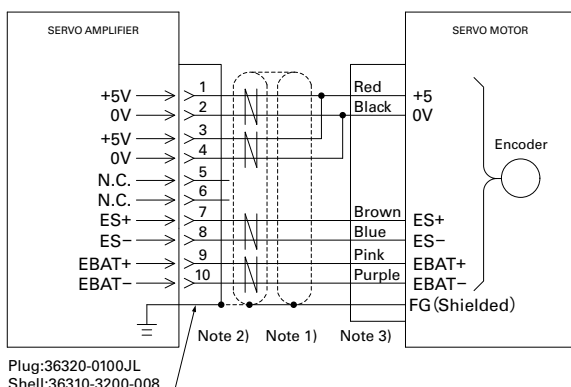
Note 3) The weight in the multi-axial specifications is of amplifier unit only.

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



Encoder Wiring Diagram

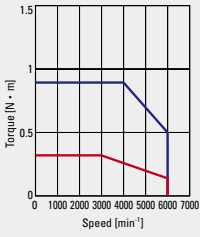
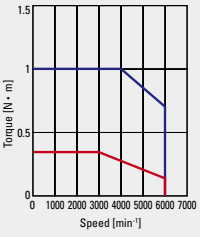
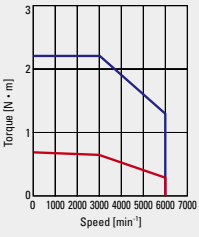
Multi-Axis Servo Amplifier



Battery backup type 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)
0.39	0.59	0.84	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)
0.23	0.3	0.35	kg
Operating Temperature: 0 to 40° C, Relative Humidity: 90% Maximum, no condensation			
RS1A01A □		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	kg
			

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

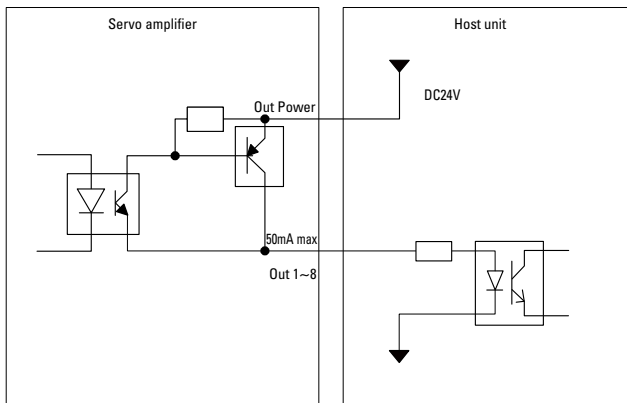
Setup Software

Optional Equipment

CANopen Interface specifications

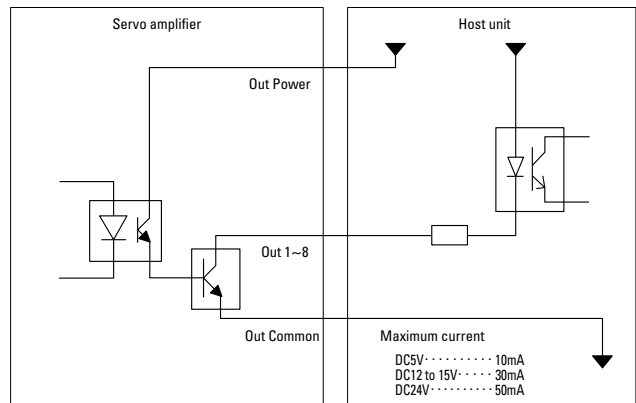
Fieldbus specifications	Bus Connection, Medium	CAN-Standard ISO-11898 (High-speed CAN)	
	Fieldbus	CANopen	
	Communication Profile	CiA DS301 Version 4.02	
	Device Profile	CiA DSP402 (CANopen device profile for drive and motion control) Version 2.0	
	Bit Rate	1Mbps, 800kbps, 500kbps(default setting), 250kbps, 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



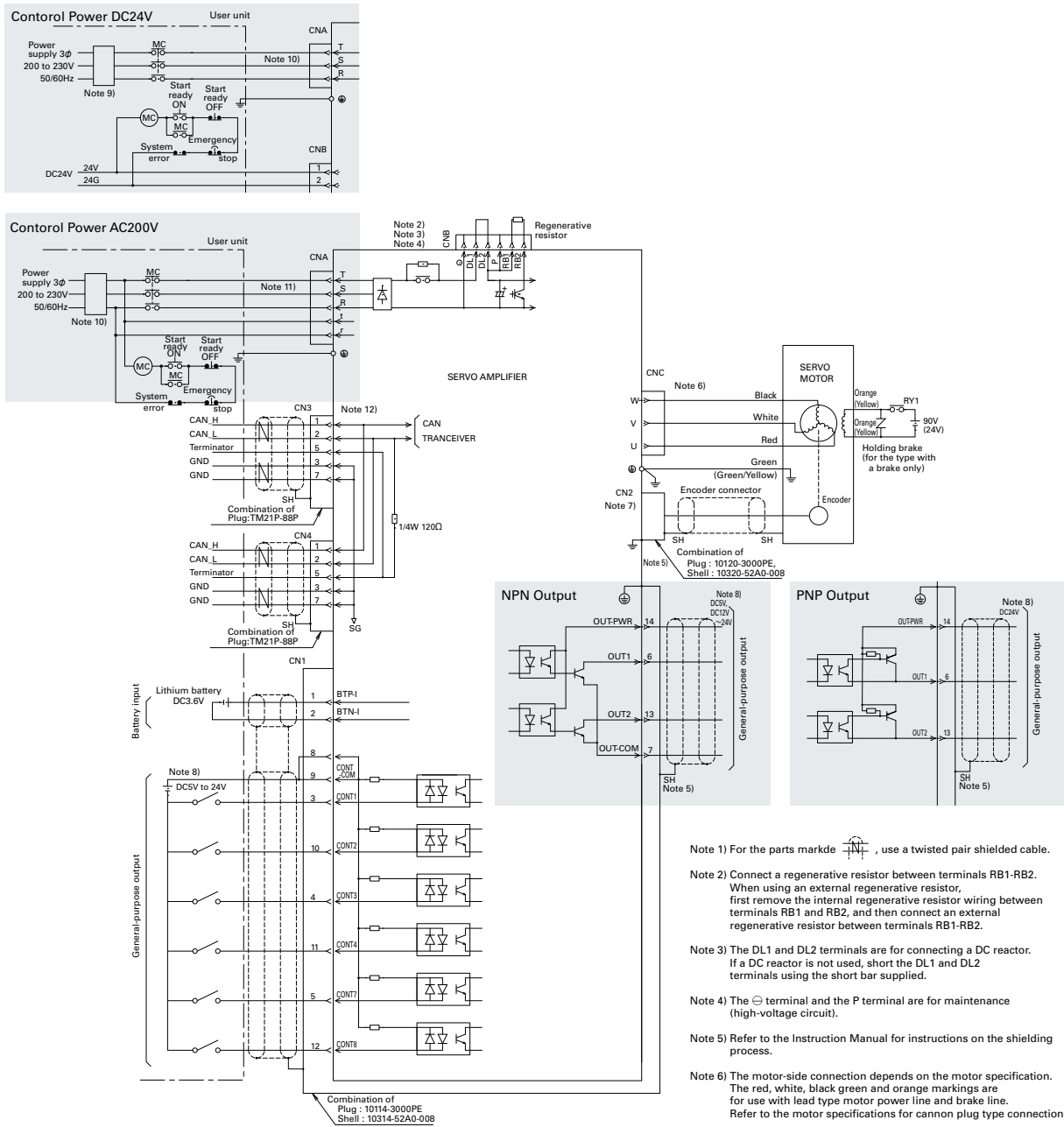
The output port counts are different depending on the specification.


NPN output



The output port counts are different depending on the specification.

Single-Axis Servo Amplifier 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.

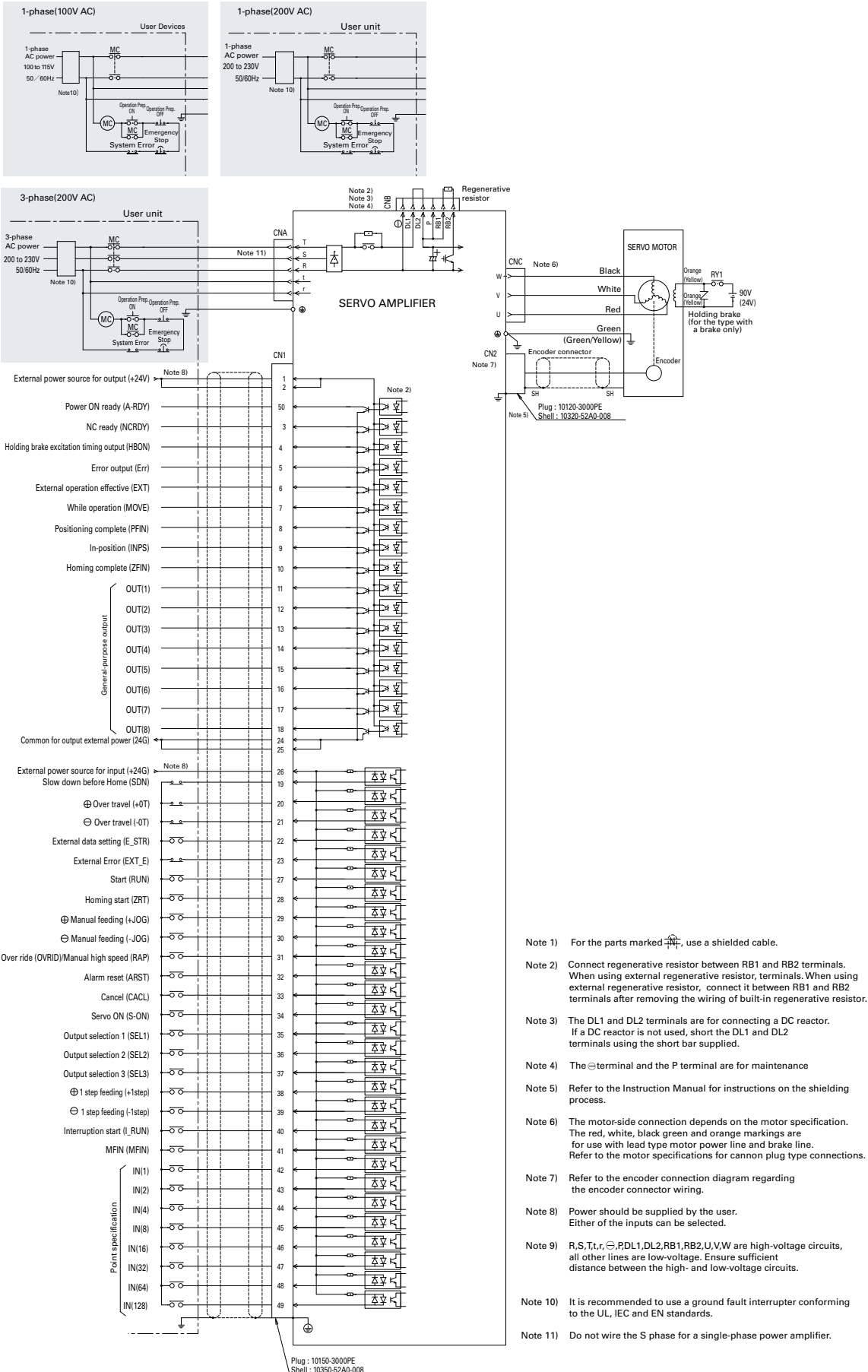
Note 9) R, S, T, r, ⊖, P, DL1, DL2, RB1, RB2, U, V, W are high-voltage circuits, all other lines are low-voltage. Ensure sufficient distance between the high- and low-voltage circuits.

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.

Single-Axis Servo Amplifier built-in positioning function model



Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

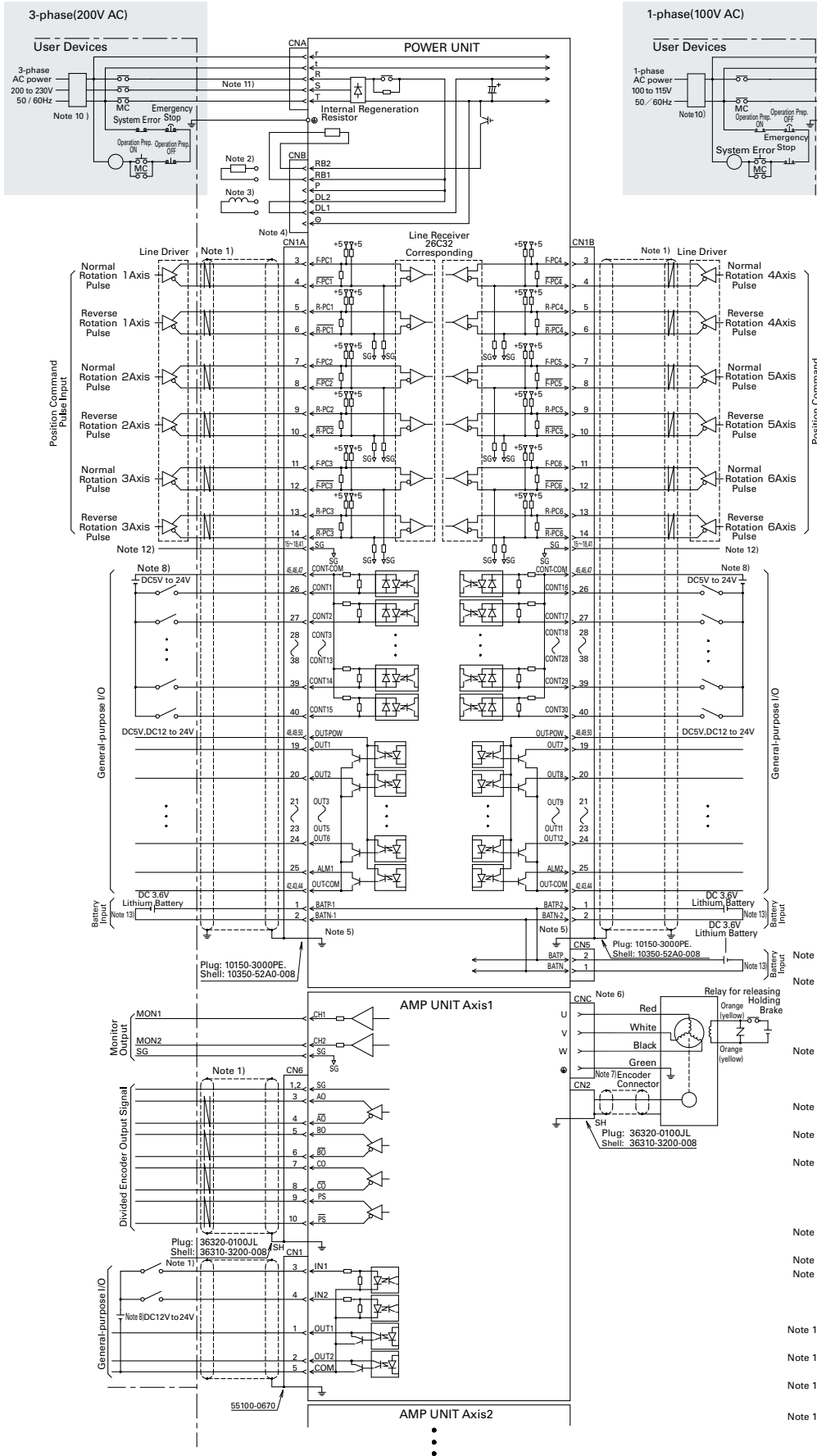
External Wiring Diagram

Dimensions

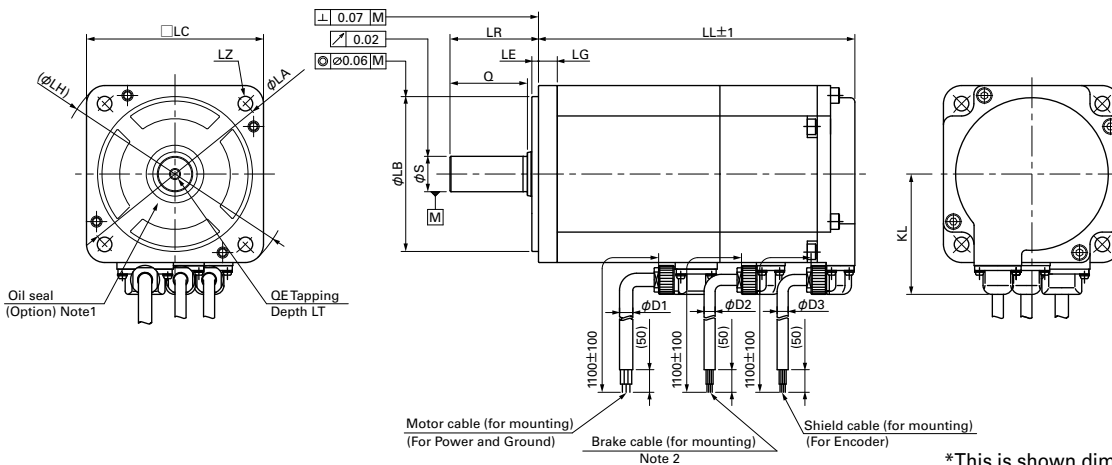
Setup Software

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	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	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	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	6.6	40
R2AA8100 △□◇	137	163	137	163									
R2AA8100 △□◇					8	59.4	100	80-0.030 ⁰	3	115.5	86	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 △□◇		25	—	—	6	5	5
R2□A06010 △□◇	8-0.009 ⁰						
R2□A06020 △□◇							
R2AA08020 △□◇		25	M5	12	6	5	5
R2AA06040 △□◇	14-0.011 ⁰						
R2AA08040 △□◇							
R2AA08075 △□◇		35	M5	12	6	5	5
R2AA8100 △□◇	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

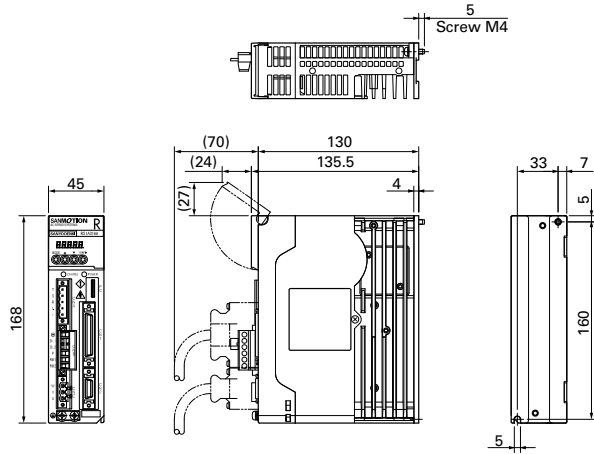
Dimensions

Setup Software

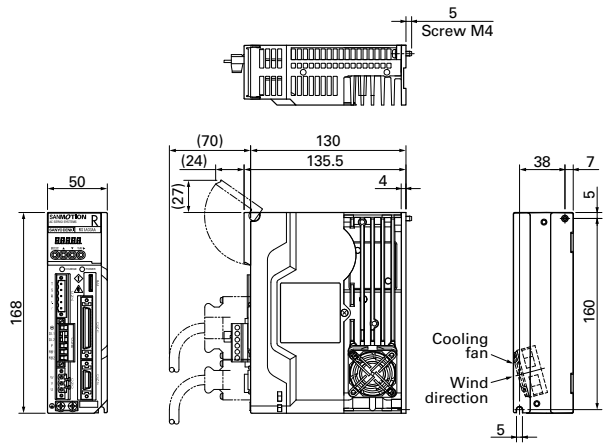
Optional Equipment

Single-Axis Servo Amplifier (Analog/Pulse input type , Built-in positioning function model)

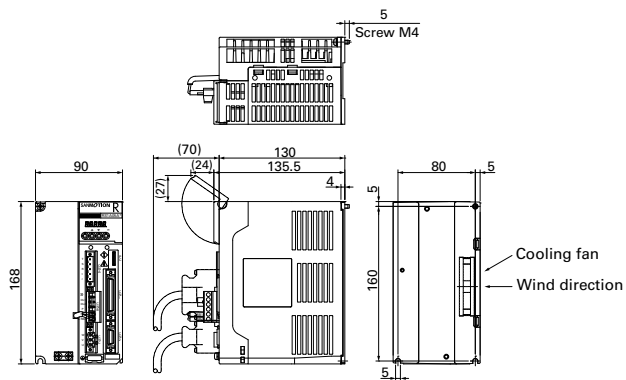
RS1 □ 01A □ (15A)



RS1 □ 03A □ (30A)

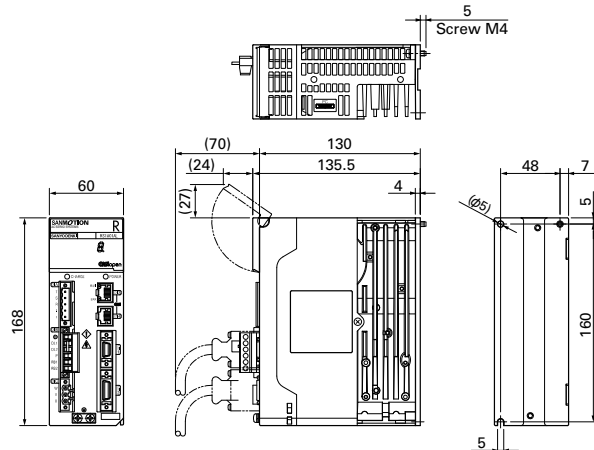


RS1 □ 05A □ (50A)

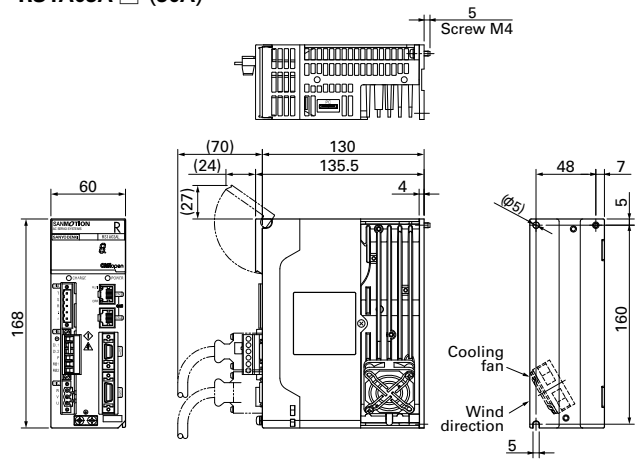


Single-Axis Servo Amplifier with CANopen (Power control AC200V)

RS1A01A □ (15A)

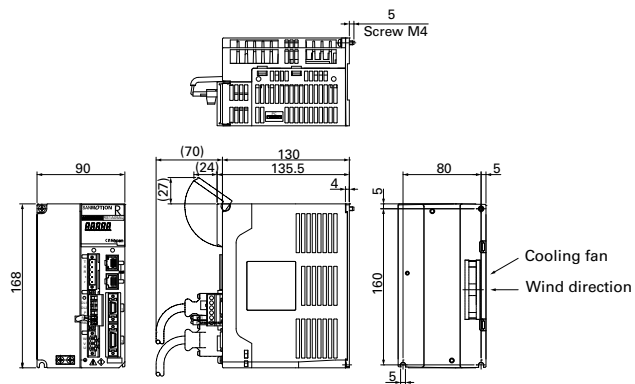


RS1A03A □ (30A)



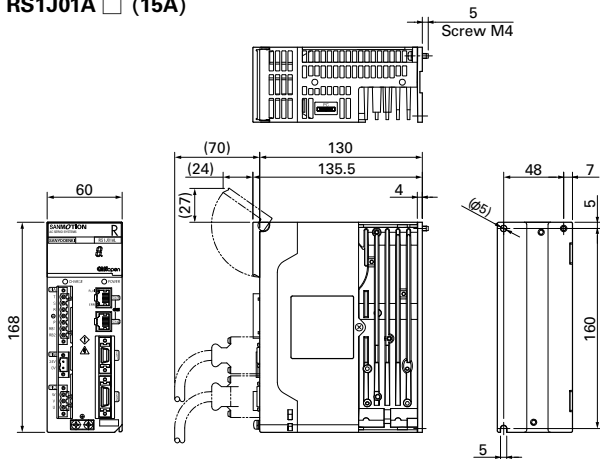
Single-Axis Servo Amplifier with CANopen (Power control AC200V)

RS1A05A □ (50A)

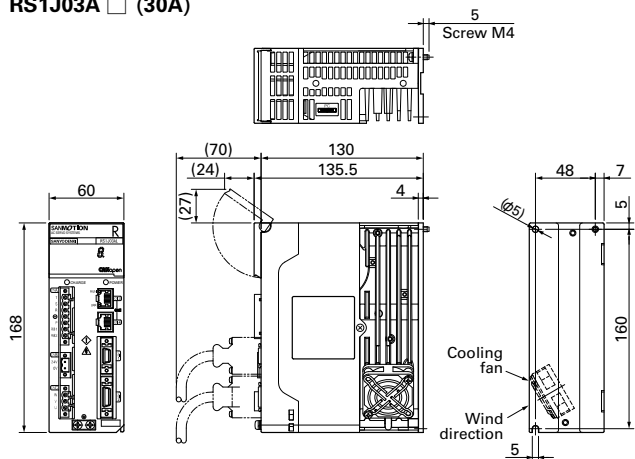


Single-Axis Servo Amplifier with CANopen (Power control DC24V)

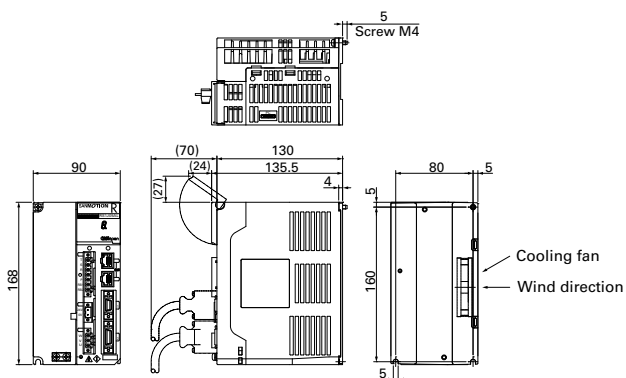
RS1J01A □ (15A)



RS1J03A □ (30A)



RS1J05A □ (50A)



Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

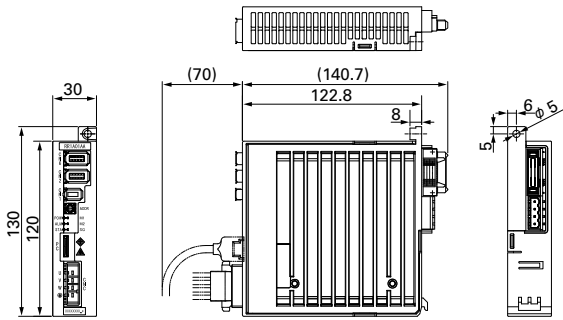
Setup Software

Optional Equipment

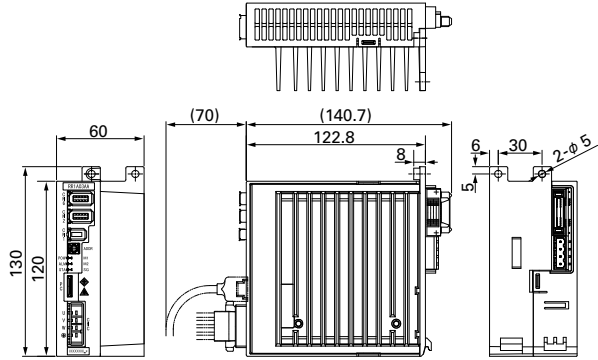
Multi-Axis Sever Amplifier

Amplifier Unit

RR1A01AAB00 (15A)

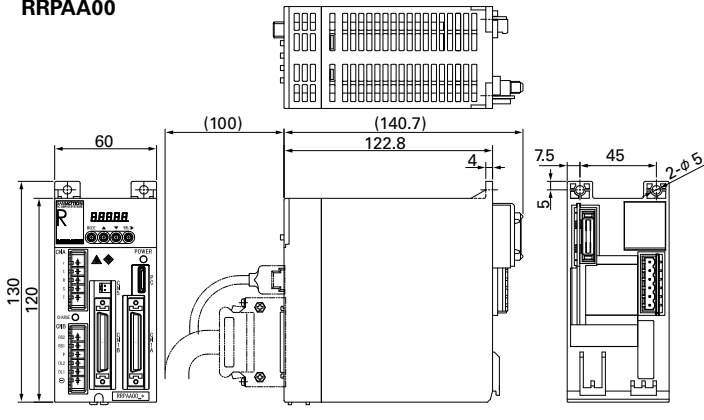


RR1A03AAB00 (30A)

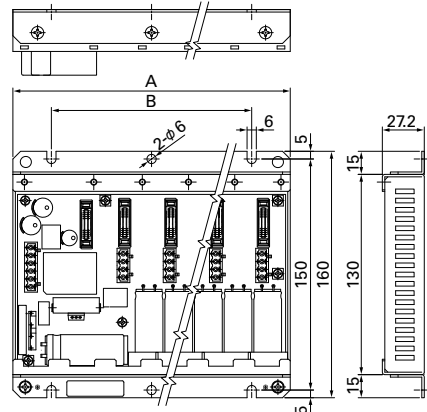


Power Unit

RRPAA00

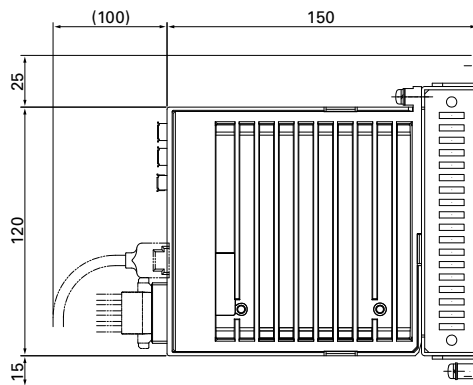
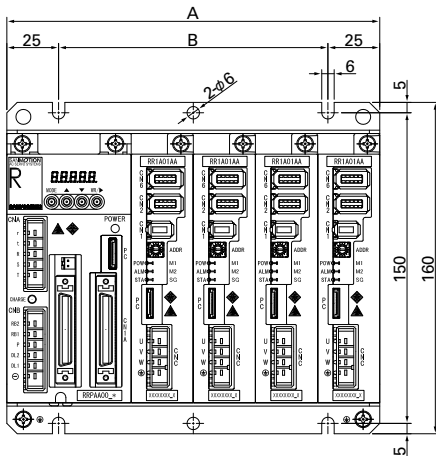


Motherboard



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	

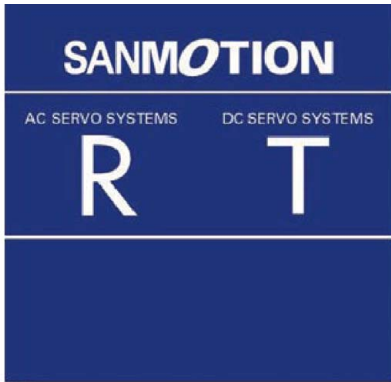
System Dimensions



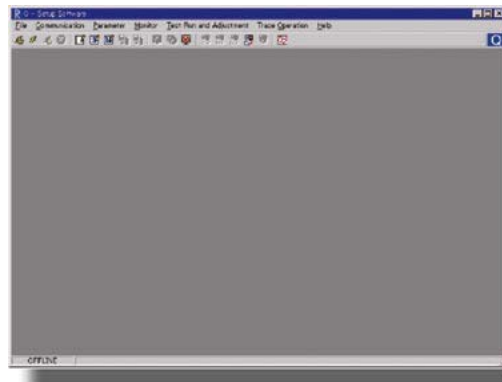
3	8	300	250
2	6	240	190
1	4	180	130
No.	Number of Slots	Supported size A B	

Setup Software

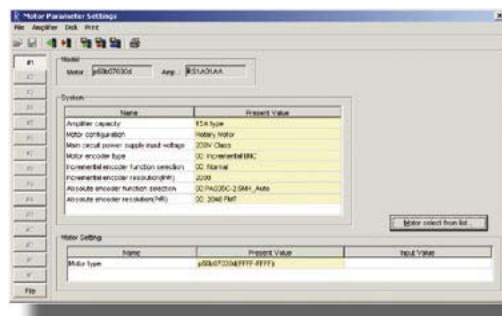
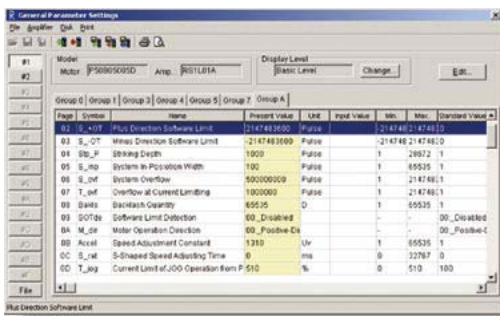
(1) Setup Software Start-up Screen



(2) Main Screen

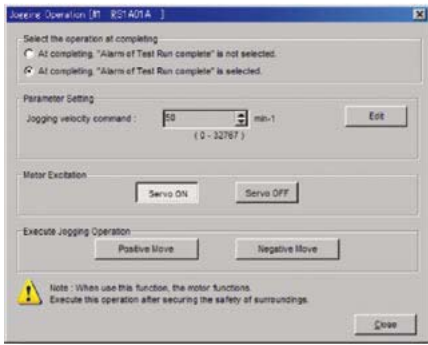


(3) Parameter Configuration Screen

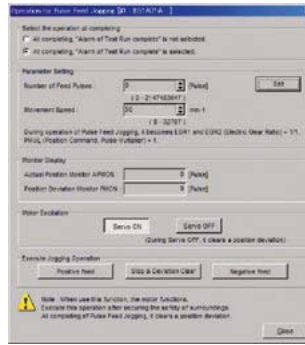


Setup Software

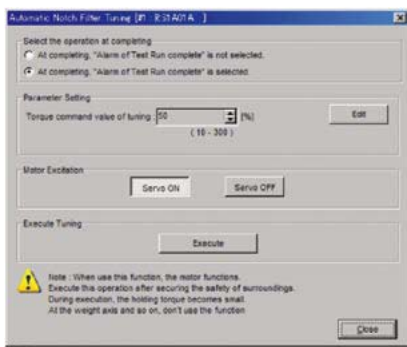
(5) Test Run and Adjustment Function



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

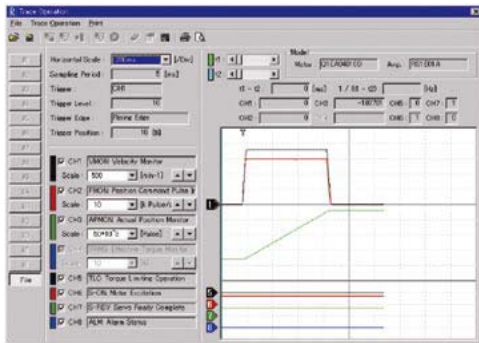


c. Auto Notch Filter Tuning : Configures the appropriate notch filter settings



d. System Analysis : Analyzes servo system frequency characteristics

(6) Operation Trace Function



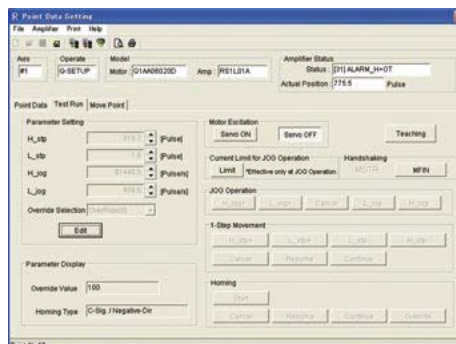
Graphically displays servo motor speed, current, and internal status

Built-in Positioning Function model Screen

Point Data Setup

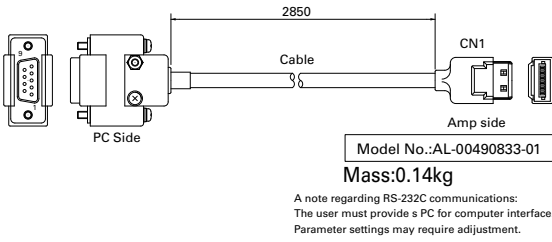
No.	Feed Rate	Position	Operation Pattern	M Output	Delay	Clamp	Dwell Time	Jump No.	Repetition
0	40.0	100.0	0 0 1 0 1 1 0 0 0 1	250	0	0	0.0	0	0
1	20.0	150.0	0 0 1 0 1 1 0 0 0 1	250	0	0	0.0	0	0
2	10.0	80.0	0 0 1 0 0 0 0 0 0 1	250	0	0	0.0	0	0
3	0.1	0.0	0 0 0 0 0 0 0 0 0 0	250	0	0	0.0	0	0
4	0.1	8.0	0 0 0 0 0 0 0 0 0 0	250	0	0	0.0	0	0
5	0.1	8.0	0 0 0 0 0 0 0 0 0 0	250	0	0	0.0	0	0
6	0.1	8.0	0 0 0 0 0 0 0 0 0 0	250	0	0	0.0	0	0
7	0.1	8.0	0 0 0 0 0 0 0 0 0 0	250	0	0	0.0	0	0
8	0.1	8.0	0 0 0 0 0 0 0 0 0 0	250	0	0	0.0	0	0
9	0.1	8.0	0 0 0 0 0 0 0 0 0 0	250	0	0	0.0	0	0
10	0.1	8.0	0 0 0 0 0 0 0 0 0 0	250	0	0	0.0	0	0

Test Run

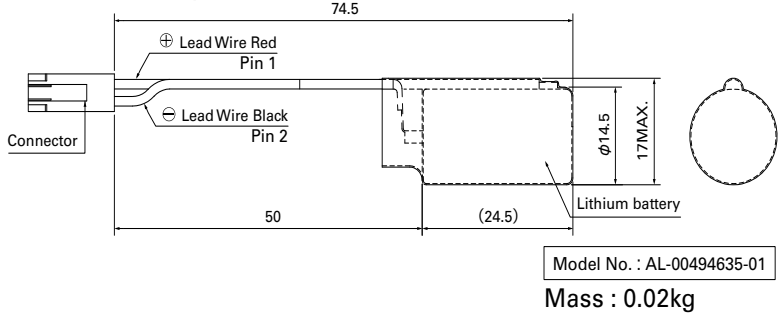


Optional Equipment

PC Interface Cable [Unit: mm]

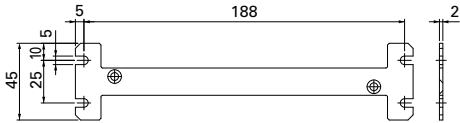


Lithium battery [Unit: mm]



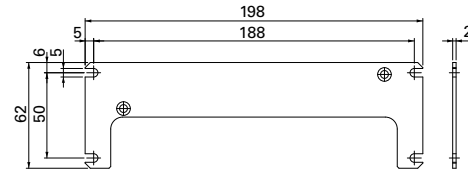
Mounting Hardware [Unit: mm] * Supported For only Single-axis amplifier.

15A / 30A Rear Side



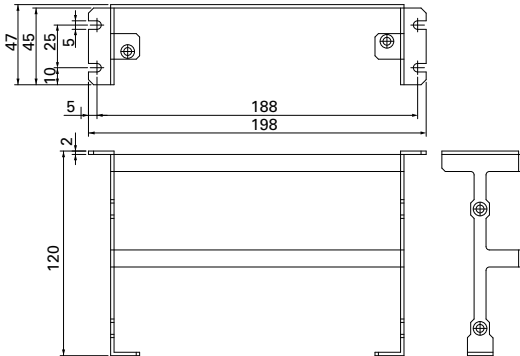
For mounting on the rear side of the amplifier
Model No.:AL-00582791-01
Applicable Amplifiers:RS1*01***
Applicable Amplifiers:RS1*03***
Material:SPCC

50A Rear Side



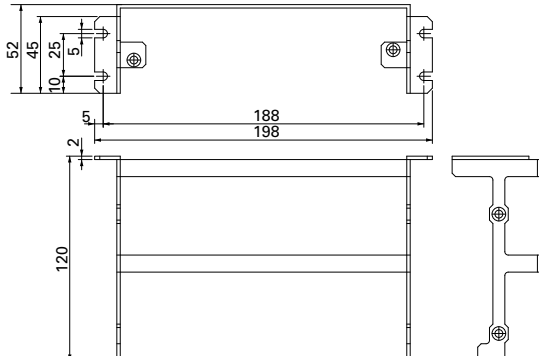
For mounting on the rear side of the amplifier
Model No.:AL-00582792-01
Applicable Amplifiers:RS1*05***
Material:SPCC

15A Front Side



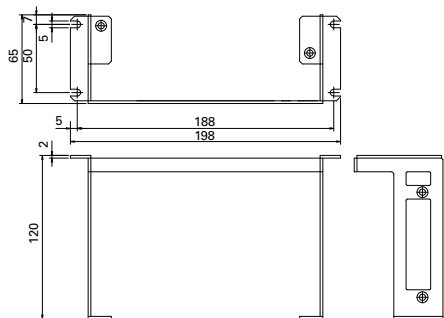
For mounting on the front side of the amplifier
Model No.:AL-00582788-01 Material:SPCC
Applicable Amplifiers:RS1*01***

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

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

Setup Software

Optional Equipment

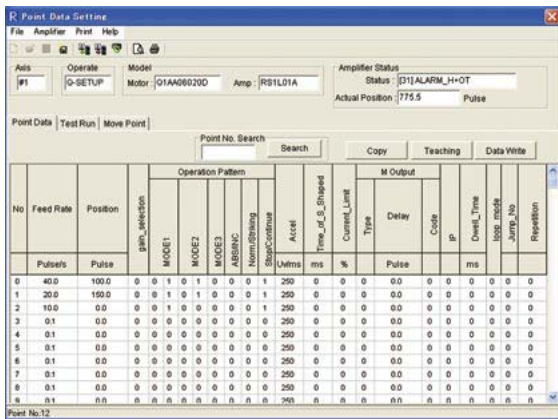
Servo Amplifier built-in positioning function

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
	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.



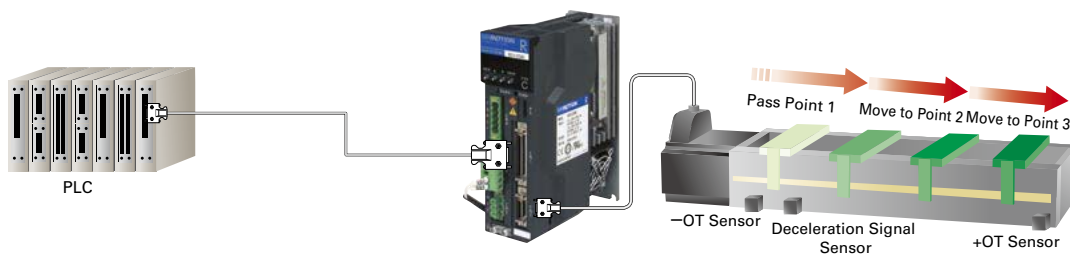
Point Data Setup

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

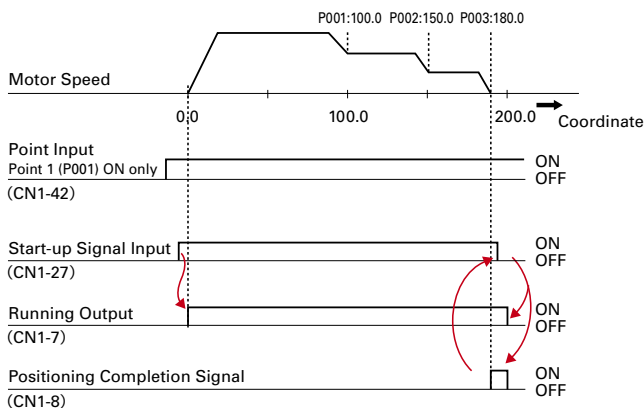
Mode 1: [01]= Positioning Operation enabled;

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

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

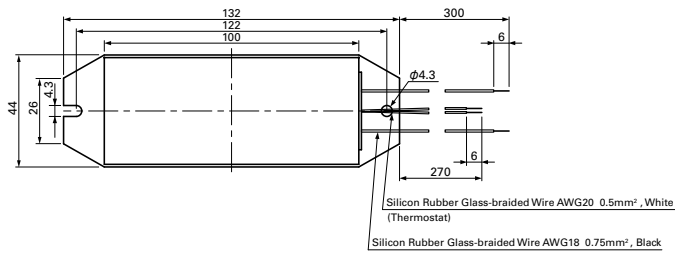


Starting Coordinates: Start-up Point 001 (P001) as 0.0



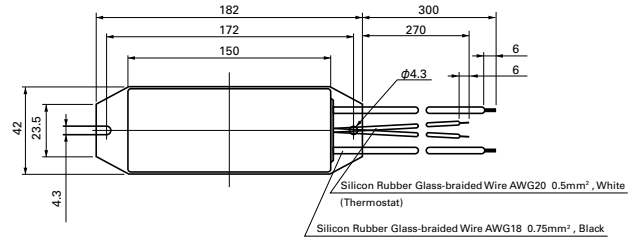
Optional Equipment

External Regenerative Resistor Dimensions [Unit: mm]



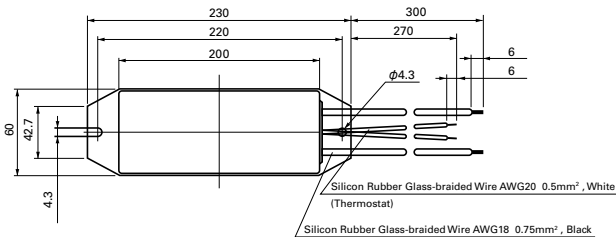
Mass : 0.19kg

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



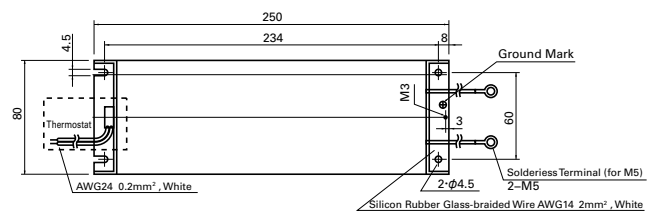
Mass : 0.24kg

	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 : 1.4kg

	Model No.	Thermostat
1	REGIST-500W20B	Normal close
2	REGIST-500W10B	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

Standard Specifications

External Wiring Diagram

Dimensions

Setup Software

Optional Equipment

Optional Equipment

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 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 Multi-Axis Servo Amplifier Connections

	Contents	Model No.	Manufacturer	Manufacturer's Part No.	
Single Connectors	Amplifier Unit	CN1 (Plug, Housing)	AL - Y0003305-01	Molex	55100-0670
		CN2 (Plug, Housing)	AL - 00632607	Sumitomo 3M	36310-3200-008
		CN6 (Plug, Housing)			36210-0100PL
		CNC (Plug)	AL - 00632604		04JFAT-SBXGF-I J-FATOT
	Power Unit	CNA (Plug)	AL - 00632600	J.S.T.Mfg.CO.,LTD	05JFAT-SBXGF-I J-FATOT
		CNB (Plug) : Accessory	AL - 00632602		06JFAT-SBXGF-I J-FATOT
		CN1A (Plug, Housing) CN1B (Plug, Housing)	AL - 00385594	Sumitomo 3M	10150-3000PE 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
	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

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 ± mm ± μm																																																																																																
5	Operation pattern <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>Feeding Speed [m/sec] vs Time [sec]</p> <p>Acceleration α: ___ G: ___ [m/s²]</p> <p>Feeding Speed V: ___ [m/s]</p> <p>Moving Distance D: ___ [m] (Stroke)</p> <p>← t1 () → ← t2 () → ← t3 () →</p> </div> <div style="font-size: small;"> <p>[Reference formula]</p> <p>1G=9.8[m/s²], 1[m/s²]≐0.1G</p> <p>α[m/s²]=V[m/sec]÷t1[sec]</p> <p>D[m]=V[m/sec]×(t1+t2)[sec]</p> </div> </div>																																																																																																
6	Mechanism Ball-screw/screw-rotation type (horizontal), ball-screw/nut-rotation type (horizontal), rack and pinion (horizontal), belt/chain (horizontal), rotary table, roll feed, instability																																																																																																
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 (pulley 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·cm⁻³</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>ρ1 (specific gravity of roll-1 material)</td><td>kg/cm³</td><td></td><td></td> </tr> <tr> <td>ρ2 (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 (pulley 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)		ρ1 (specific gravity of roll-1 material)	kg/cm ³			ρ2 (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()																																																																																																
0	Input format Position , velocity , torque , other ()																																																																																																
A	Host equipment (controller) Sequencer , laptop , customer-developed product , Sanyo dennki-provided , other ()																																																																																																
B	Usage environment and other requirements Cutting , clean-room use , anti-dust measures , other ()																																																																																																
C	Estimated production Single product: () units/month () units/year																																																																																																
D	Development schedule Prototype period: () Year () Month Production period: () Year () Month																																																																																																
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Features and Functions
 Model Number Nomenclature
 System Configuration
 Standard Specifications
 External Wiring Diagram
 Dimensions
 Setup Software
 Optional Equipment

■ ECO PRODUCTS



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

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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.

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- Read the accompanying Instruction Manual carefully prior to using the product.
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- Do not perform any retrofitting, re-engineering, or modification to this equipment.
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