

SANMOTION



AC SERVO SYSTEMS

R



SANYO DENKI

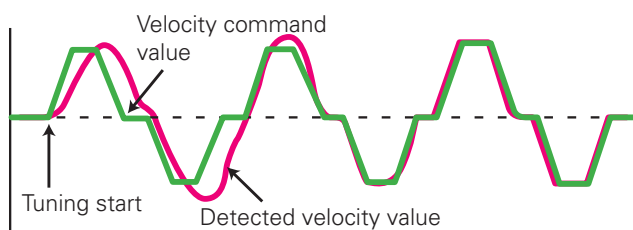
Ver.3

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.



Water Protection

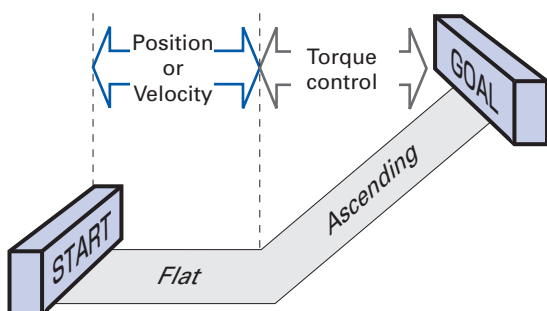
All motor models have IP67 protection.



*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.



*available for single-axis only

Power Supply Harmonic Suppression

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



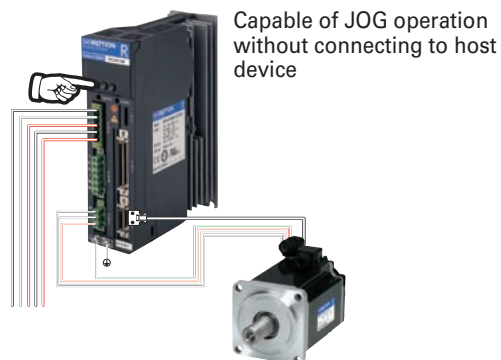
5-digit LED Display, Built-in Operator

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



Test Function (JOG)

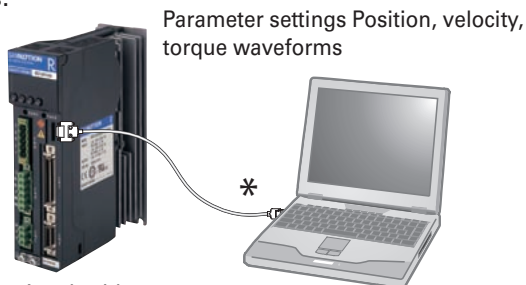
On-board JOG operation function is available for testing motor and amplifier connection without the need to connect to host device.



*Multi-axis is done through a personal computer.

Setup Software

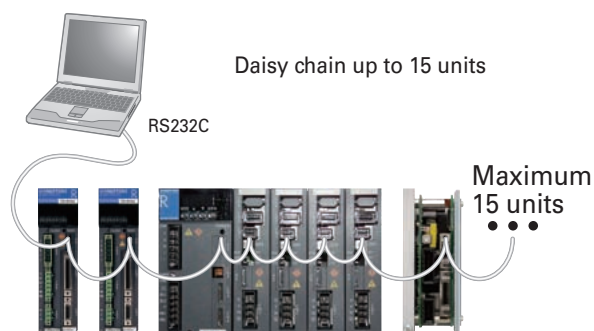
The setup software allows you to set parameters, view graphical displays of monitored position, velocity or torque waveforms, and perform system analysis.



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

Simultaneous Monitor Function

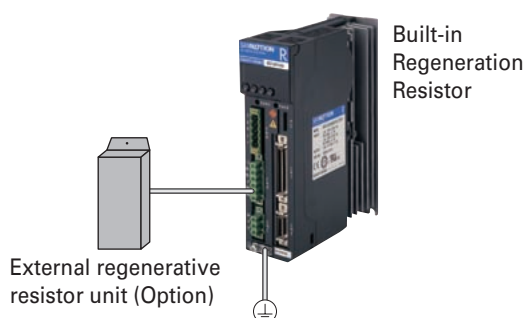
The setup software allows up to 15 amplifiers to be monitored. This function can be used to monitor waveforms in synchronized operations.



*PC connection cable is optional

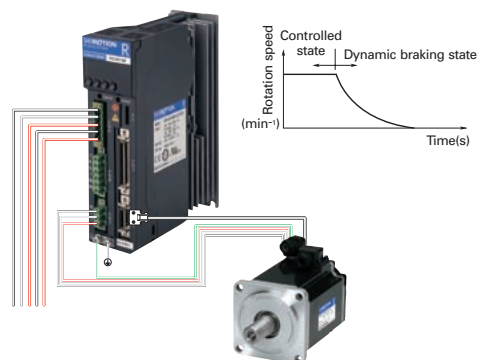
Built-in Regeneration Resistor

A built-in regeneration resistor can be used to absorb regenerative energy generated during motor deceleration. External regeneration resistors can be added if internal regeneration capacity is insufficient.



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.

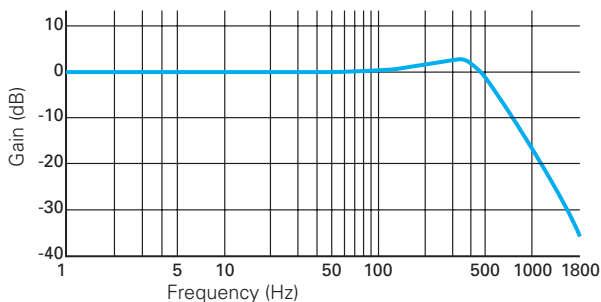


CONCEPT 2

Improved Precision and Reduced Cycle Time

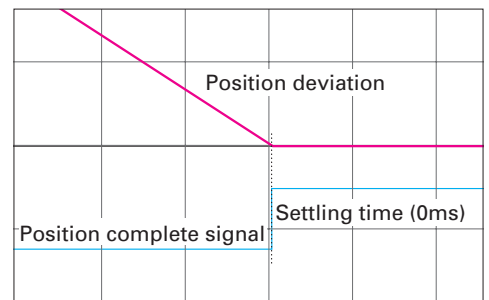
High Response

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



Shorter Position Settling Time

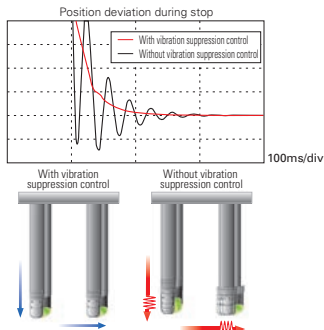
A new algorithm drastically shortens positioning settling time for equipment.



Example of positioning settling time in highly rigid machinery

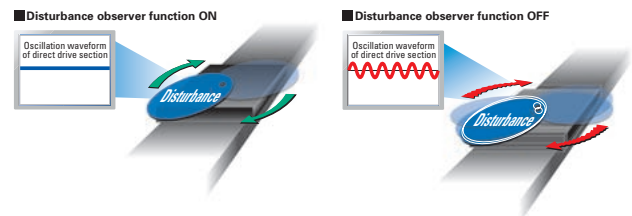
Vibration Suppression Control

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.



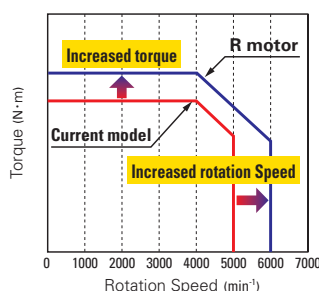
Disturbance Suppression

A new disturbance observer with expanded applicable frequencies suppresses disturbance from other axes in a multi-axis configuration.



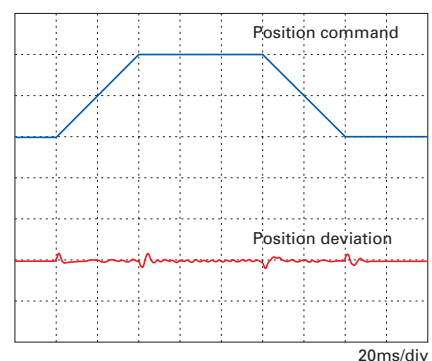
Expanded Power Range

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.



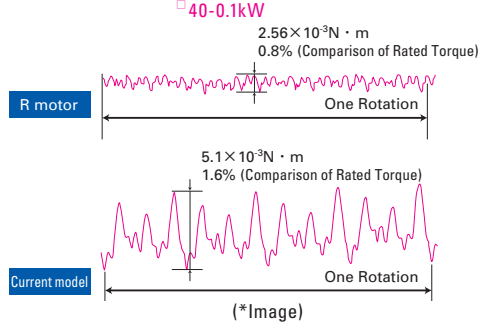
CONCEPT 3

Reduced Running Costs

Low Cogging Torque

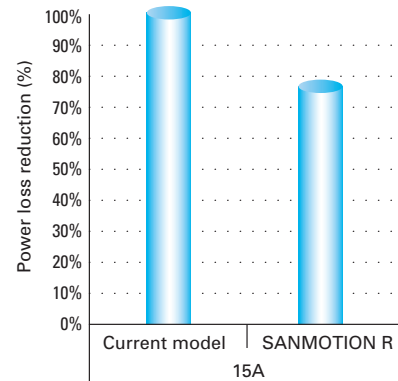
Using our proprietary technology, the motor's low cogging torque delivers smooth rotation that is ideal for high precision processes and vibration-sensitive conveyor applications.

Comparison of cogging torque waveforms



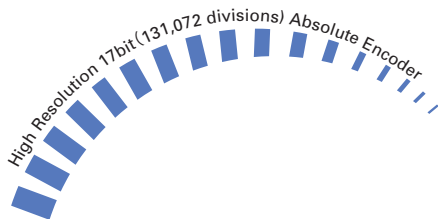
20% Reduction in Power Loss

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



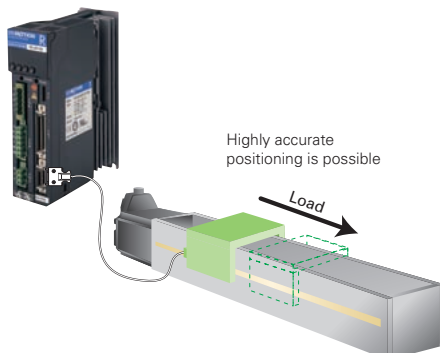
High Resolution

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

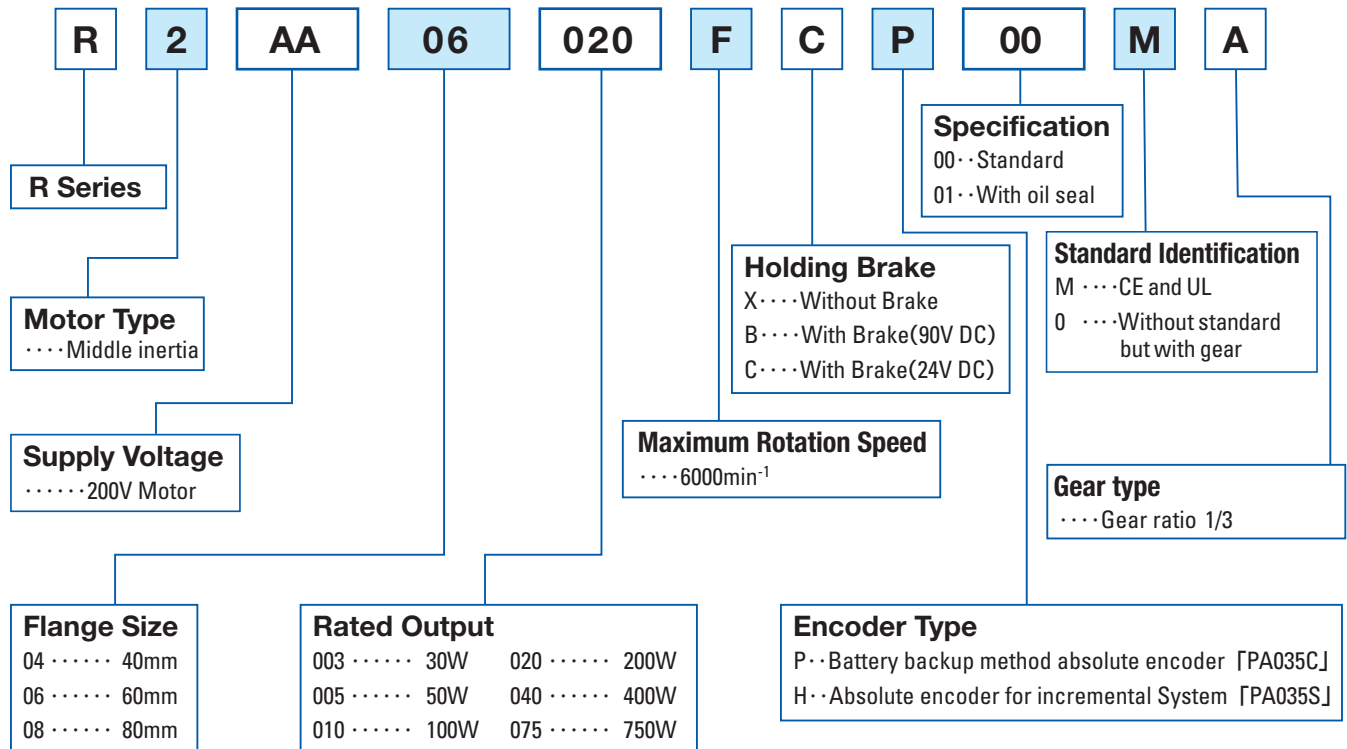
Setup Software

Optional Equipment

Servo Motor 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 gear ratio 1/3.



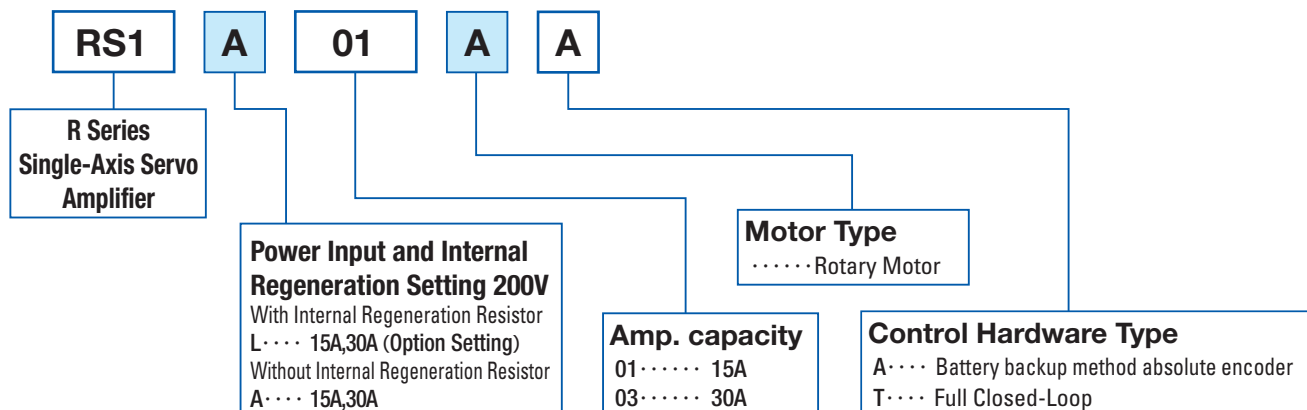
Encoder Specification

Model	Per rotation	Multiple Rotations	Remarks
PA035C	131072(17bit)	65536(16bit)	Battery backup method Absolute encoder
PA035S	131072(17bit)	—	Absolute Encoder for Incremental system

Servo Amplifier Model Number Nomenclature

Single-Axis Servo Amplifier

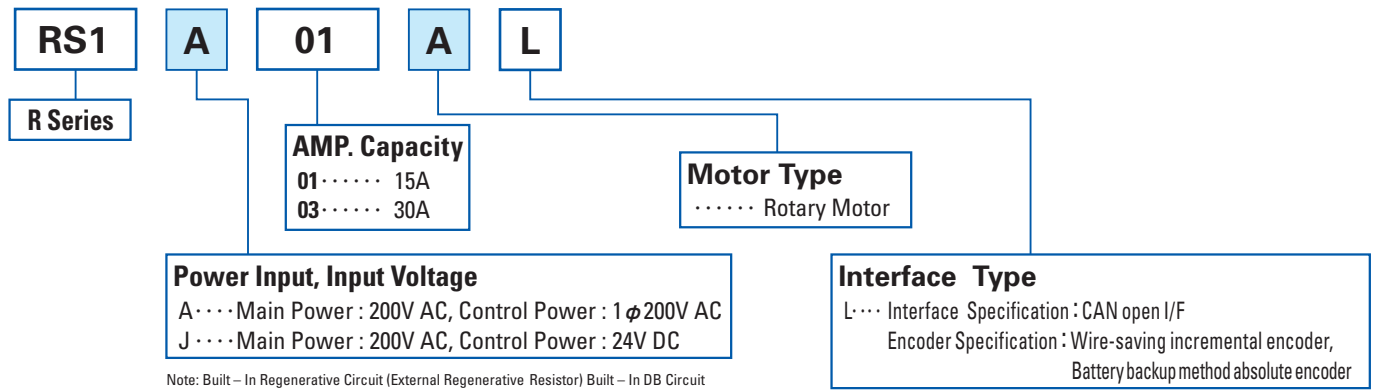
Example: The model number shown below is "R" Series Servo Amplifier with 200V AC input voltage and 15A amplifier capacity.



Servo Amplifier Model Number Nomenclature

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.

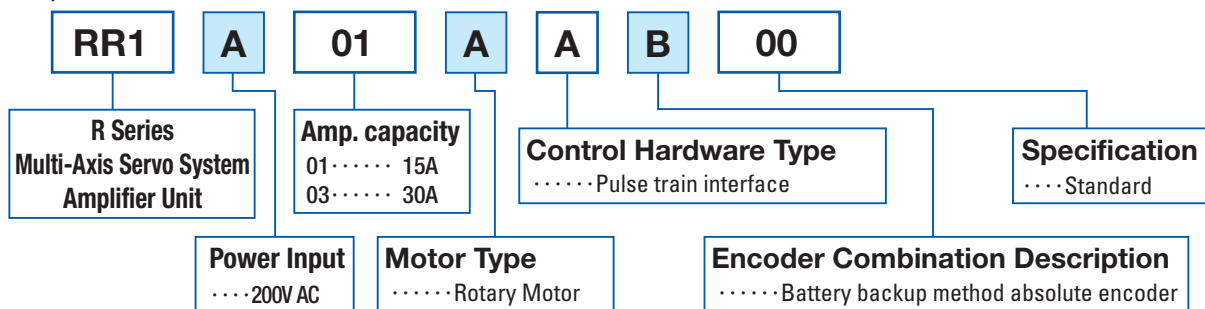


Multi-Axis Servo Amplifier

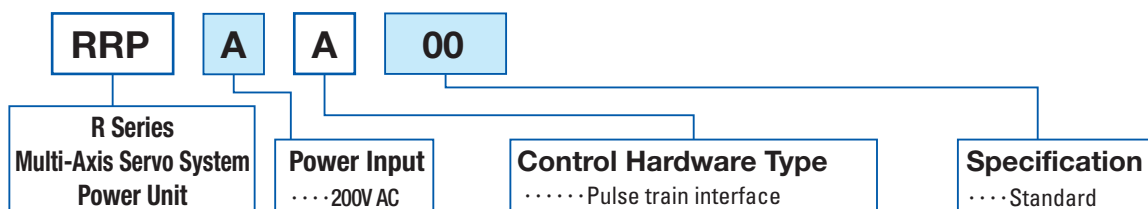
Example: The model number shown below is a 4-axis "R" series multiaxis servo amplifier configuration with 200V AC input voltage, 2 units of 15A amplifiers, 2 units of 30A amplifiers, and pulse train interface.

Amplifier Unit RR1A01AAB00 $\times$ 2 units
 RR1A03AAB00 $\times$ 2 units
 Power Unit RRPAA00 $\times$ 1 unit
 Motherboard RRMA600 $\times$ 1 unit

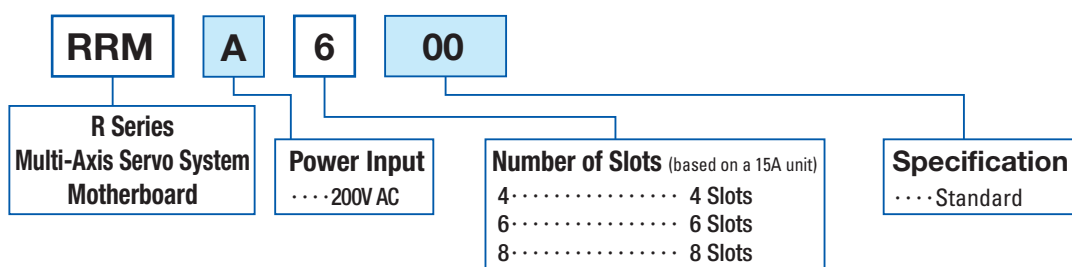
Amplifier Unit



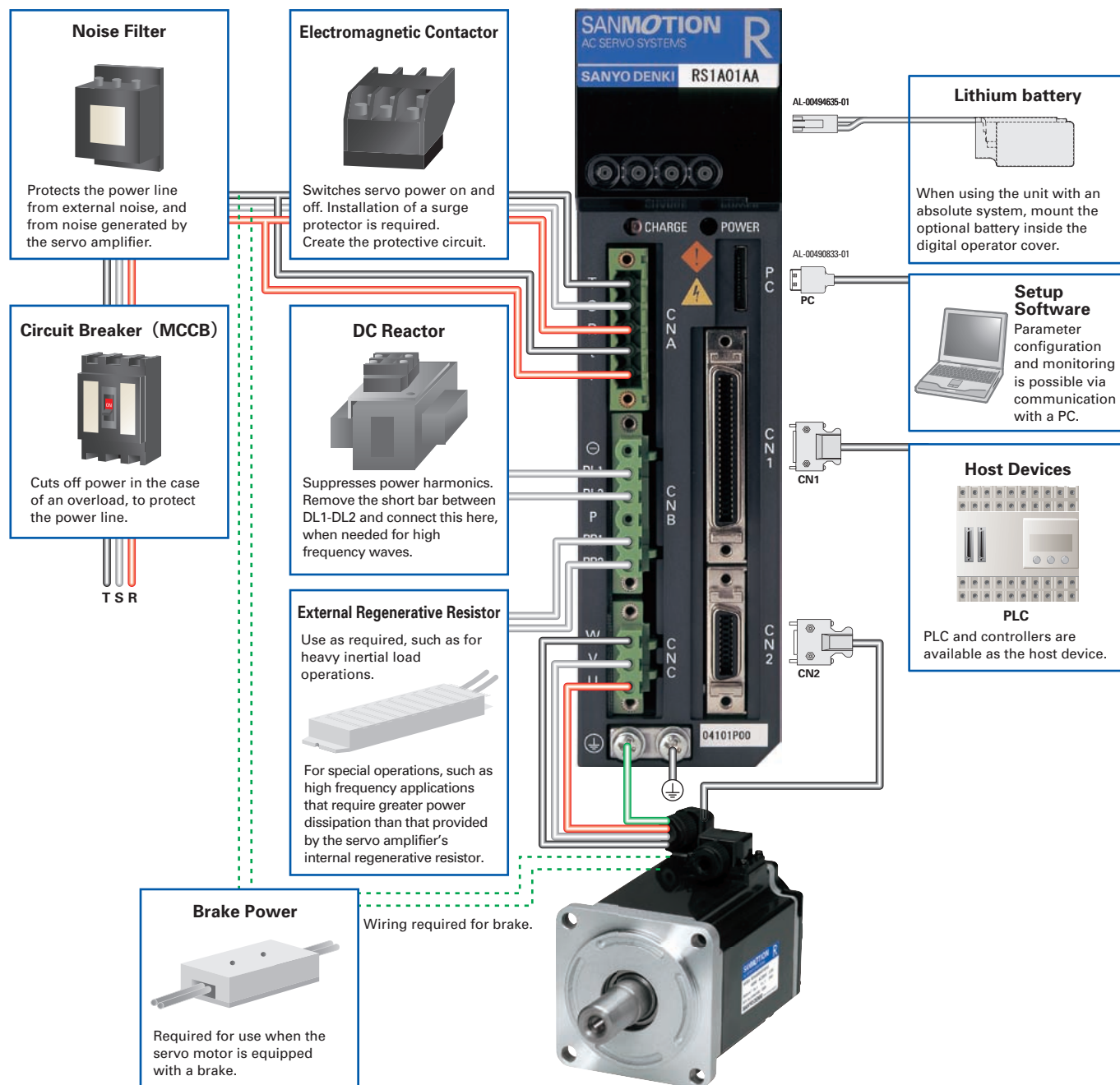
Power Unit



Motherboard



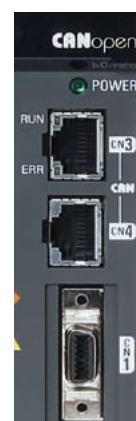
Single-Axis Amplifier



Connectors for Single-Axis Amplifier Connections

	Contents	Model No.
Single Connectors	CN1 (Plug, Housing)	AL - 00385594
	CN2 (Plug, Housing)	AL - 00385596
	CNA (Plug)	AL - 00329461-01
	CNB (Plug) : Accessory	AL - Y0000988-01
	CNC (Plug)	AL - 00329458-01
Connector Sets	CN1,CN2 (Plug, Housing) CNA,CNC (Plug)	AL - 00393603
	CN1,CN2 (Plug, Housing)	AL - 00292309

CANopen



Host Devices

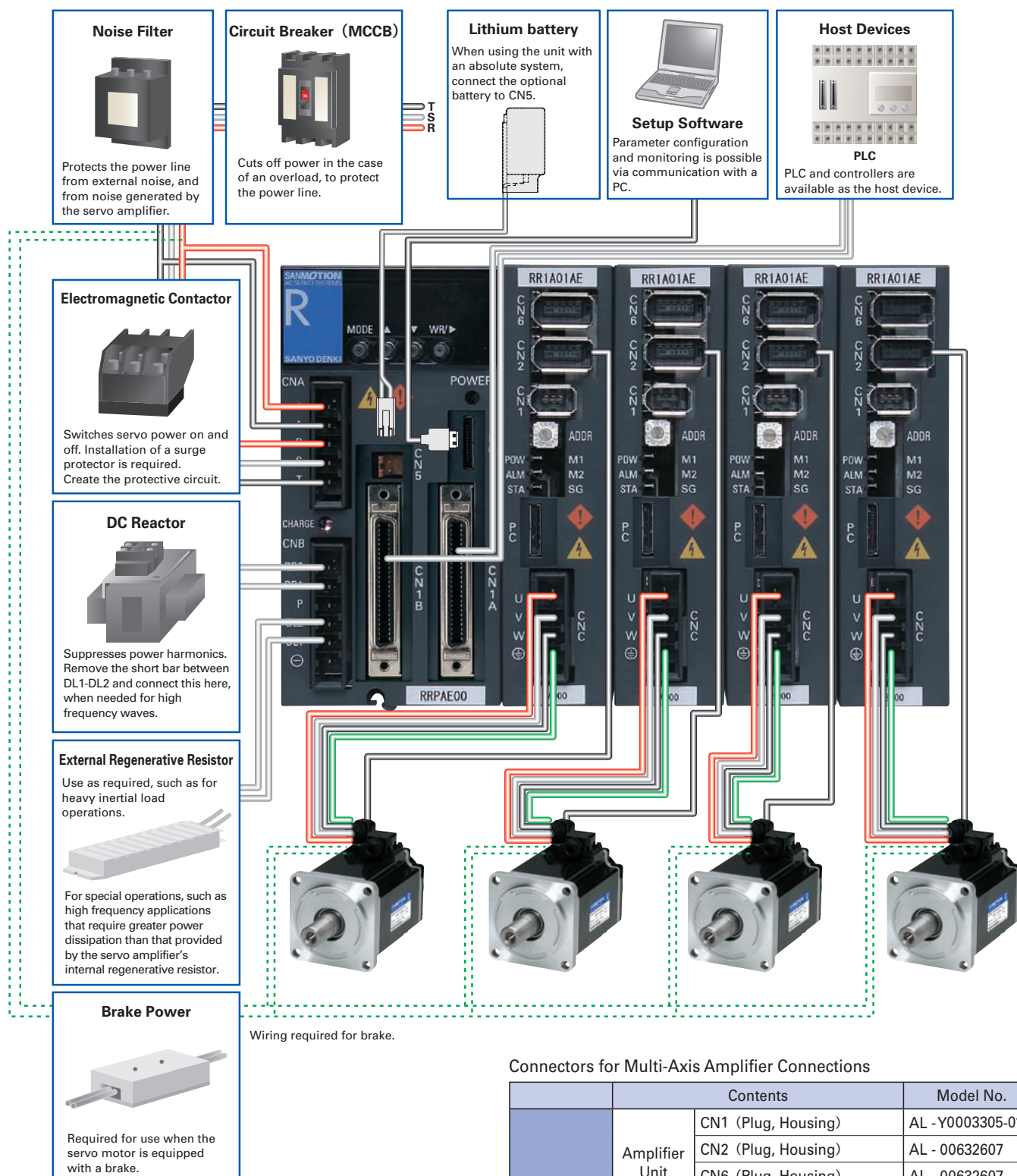


SANMOTION C

Dedicated controller (SANMOTION C* etc.), PC and PLC are available as the host device.

*Communication Profile: DS-301
Device Profile: DSP-402 compliance

Multi-Axis Amplifier



Connectors for Multi-Axis Amplifier Connections

	Contents		Model No.
Single Connectors	Amplifier Unit	CN1 (Plug, Housing)	AL - Y0003305-01
		CN2 (Plug, Housing)	AL - 00632607
		CN6 (Plug, Housing)	AL - 00632607
		CNC (Plug)	AL - 00632604
	Power Unit	CNA (Plug)	AL - 00632600
		CNB (Plug) : Accessory	AL - 00632602
		CN1A (Plug, Housing)	AL - 00385594
Connector Sets	Amplifier Unit	CN1,CN2 (Plug, Housing) CN6,CNC (Plug)	AL - 00632611
	Power Unit	CNA (Plug) CN1A,CN1B (Plug, Housing)	AL - 00632609

Standard Specifications



R2

Servo Motor
200V System

Capacity

□40mm to □80mm
30W to 750W
(9 models)

Features

High Efficiency and Low
Ripple (Medium Inertia)

Motor Dwgs P15

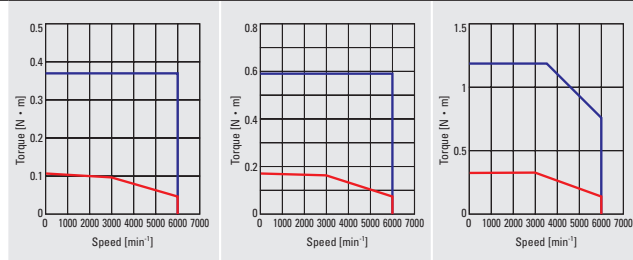
★:Indicates a typical value after warm-up and thermal stabilization, together with a standard amplifier.

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

Motor Model and Flange Size in mm				R2AA04003F 〈40〉	R2AA04005F 〈40〉	R2AA04010F 〈40〉
	Status	Symbol	Unit			
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		
Mass including Encoder		W _E	kg	0.23	0.27	0.39
Brake Static Friction Torque		T _B	N·m	0.32 MIN.		
Brake Rated Voltage		V _B	V	DC90V／DC24V ± 10%		
Brake Rated Current		I _B	A	0.07／0.27		
Rotor Moment of Inertia (Brake)		J _B	×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)				RS1A01AA		
Amplifier Model (CANopen)				RS1A01AL		
Amplifier Model (Multi-Axis)				RR1A01AA		
Amplifier Power Supply				AC200V to 230V +10, -15% 50/60Hz ± 3Hz		
Amp. Operating Temp. and RH				Operating Temperature: 0 to 55° C (Note), Relative Humidity: 90% Maximum, no condensation		
Power Consumption			kVA	0.2		0.4
Amplifier Mass (Weight) [Single / CAN / Multi]			kg	0.9／1.0／0.48		

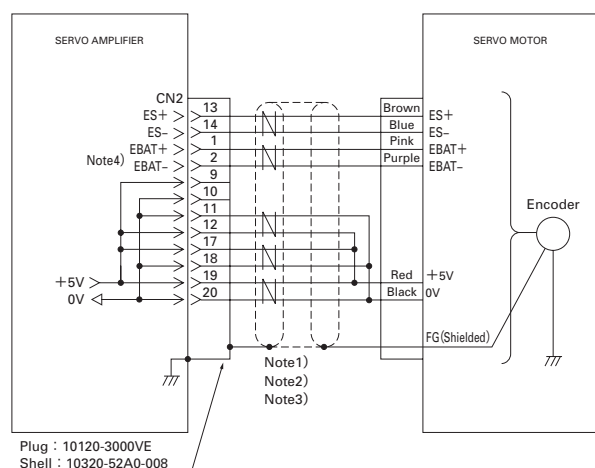
Note) The multi-axis type amplifier has an ambient operating temperature of 0 to 40°C. The operating temperature with forced air cooling is 0 to 55°C.

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



Encoder Wiring Diagram

Single-Axis Amplifier



Plug : 10120-3000VE
Shell : 10320-52AO-008

Battery backup type absolute encoder [PA035C]

Absolute encoder for incremental system [PA035S]

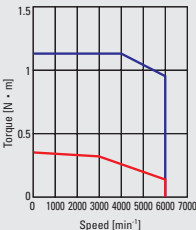
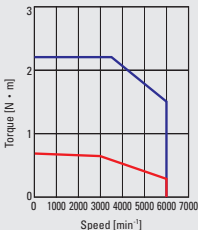
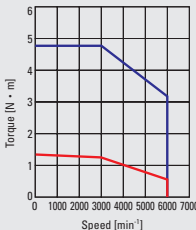
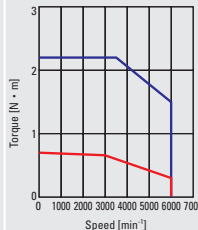
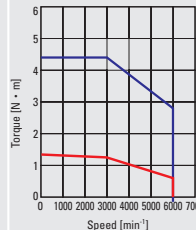
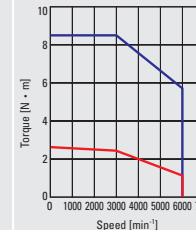
Note 1) Use a twisted-pair shielded cable.

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

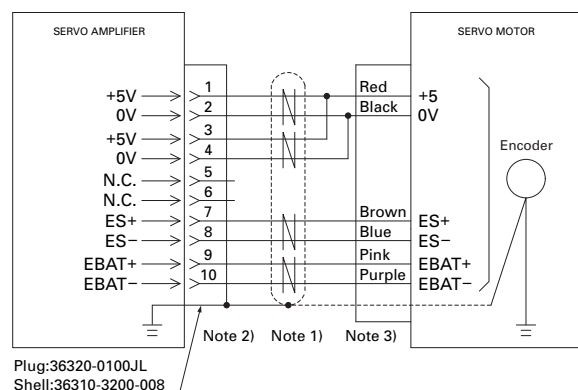
Encoder cable length	10m MAX.	25m MAX.	40m MAX.
+5V DC Wiring	Connect pin 19 (Do not connect pins12,17)	Connect pin 17,19 (Do not connect pins12)	Connect pin 12,17,19
0V DC Wiring	Connect pin 20 (Do not connect pins11,18)	Connect pin 18,20 (Do not connect pins11)	Connect pin 11,18,20

Note 3) Use a 0.2mm² encoder cable

Note 4) When the Absolute encoder for incremental system is used, battery lines (EBAT+, EBAT-) are not required.

R2AA06010F 《60》	R2AA06020F 《60》	R2AA06040F 《60》	R2AA08020F 《80》	R2AA08040F 《80》	R2AA08075F 《80》	Unit
100	200	400	200	400	750	W
3000						min ⁻¹
6000						min ⁻¹
0.318	0.637	1.273	0.637	1.27	2.39	N·m
0.353	0.686	1.372	0.686	1.37	2.55	N·m
1.13	2.2	4.8	2.2	4.4	8.5	N·m
0.86	1.5	2.8	1.4	2.6	4.6	Arms
0.86	1.6	2.8	1.5	2.6	4.6	Arms
3.5	5.6	10.8	4.8	8.9	15.5	Arms
0.375	0.476	0.524	0.516	0.559	0.559	N·m/Arms
13.1	16.6	18.3	18.0	19.5	19.5	mV/min ⁻¹
4.8	2.7	1.36	2.3	0.93	0.4	Ω
8.6	19	39	8	16	31	kW/s
2.0	2.6	3.2	2.2	2.5	3.0	ms
1.2	0.78	0.61	1.3	0.93	0.70	ms
0.117	0.219	0.412	0.52	1.04	1.82	×10 ⁻⁴ kg·m ² (GD ² /4)
0.0033						×10 ⁻⁴ kg·m ² (GD ² /4)
0.59	0.84	1.3	1.2	1.6	2.6	kg
0.36 MIN.	1.37 MIN.		2.55 MIN.			N·m
DC90V / DC24V ± 10%						V
0.07 / 0.27	0.11 / 0.32		0.12 / 0.37			A
0.060	0.060		0.25			×10 ⁻⁴ kg·m ² (GD ² /4)
0.30	0.35		0.85			kg
Operating Temperature: 0 to 40° C, Relative Humidity: 90% Maximum, no condensation						
RS1A01AA		RS1A03AA	RS1A01AA	RS1A03AA		
RS1A01AL		RS1A03AL	RS1A01AL	RS1A03AL		
RR1A01AA		RR1A03AA	RR1A01AA	RR1A03AA		
AC200V to 230V +10, -15% 50/60Hz ± 3Hz						
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	kVA
0.9 / 1.0 / 0.48		1.0 / 1.11 / 0.77	0.9 / 1.0 / 0.48	1.0 / 1.11 / 0.77		kg
						

Multi-Axis Amplifier



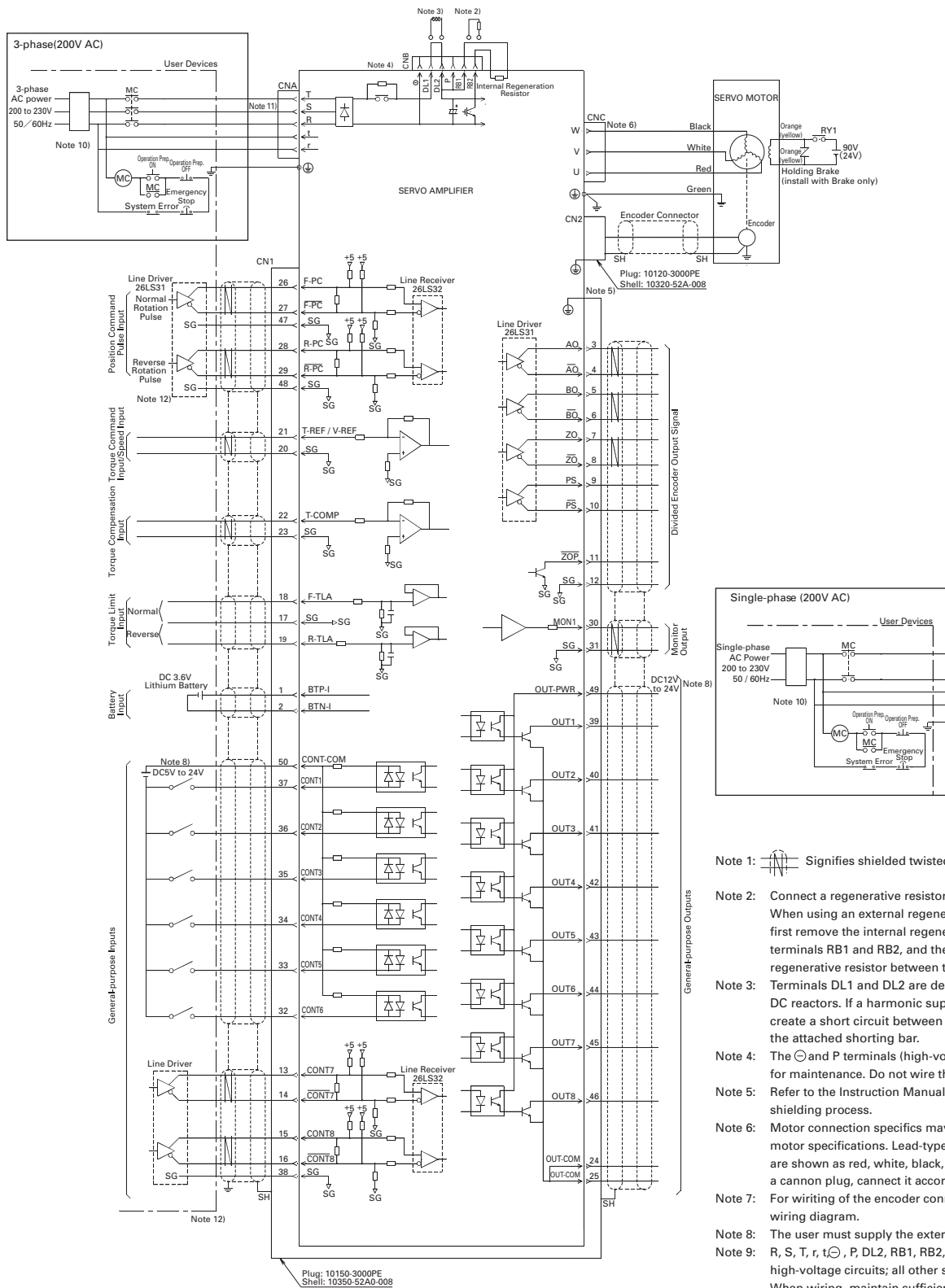
Battery backup type absolute encoder [PA035C]

- 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(impedence) 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.

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) Heartbeat	PDO (Process Data Object) NMT (Network Management) Node Guarding
	PDO Transfer Modes	Synchronous transmission	Asynchronous transmission
	Mode of Operation	Homing Mode (h.m) Profile Velocity Mode (p.v)	Profile Position Mode (p.p) Interpolated Position Mode (i.p)

Single-Axis Amplifier



Note 1: Signifies shielded twisted-pair 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: Terminals DL1 and DL2 are dedicated for connecting DC reactors. If a harmonic suppression reactor is not in use, create a short circuit between DL1 and DL2 terminals with the attached shorting bar.

Note 4: The $\odot$ and P terminals (high-voltage circuit) are reserved for maintenance. Do not wire these terminals.

Note 5: Refer to the Instruction Manual for instructions on the shielding process.

Note 6: Motor connection specifics may vary depending on the motor specifications. Lead-type motor power and brake wires are shown as red, white, black, green, and orange. When using a cannon plug, connect it according to the motor specifications.

Note 7: For wiring of the encoder connectors, refer to the encoder wiring diagram.

Note 8: The user must supply the external power supply.

Note 9: R, S, T, r, $\odot$, P, DL2, RB1, RB2, U, V, W are high-voltage circuits; all other signal lines are low-voltage circuits. When wiring, maintain sufficient distance between high-voltage and low-voltage circuits.

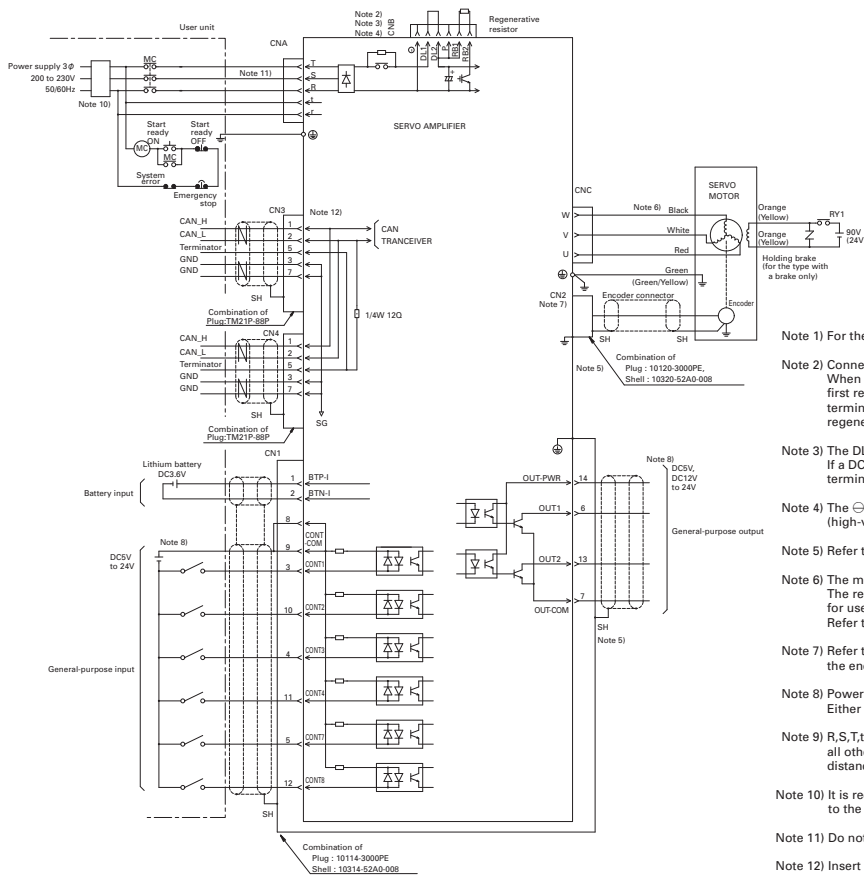
Note 10: Installation of a UL compliant and IEC / EN compliant earth leakage circuit breaker is recommended.

Note 11: When wiring the single-phase power supply, do not wire the S-phase to the amplifier.

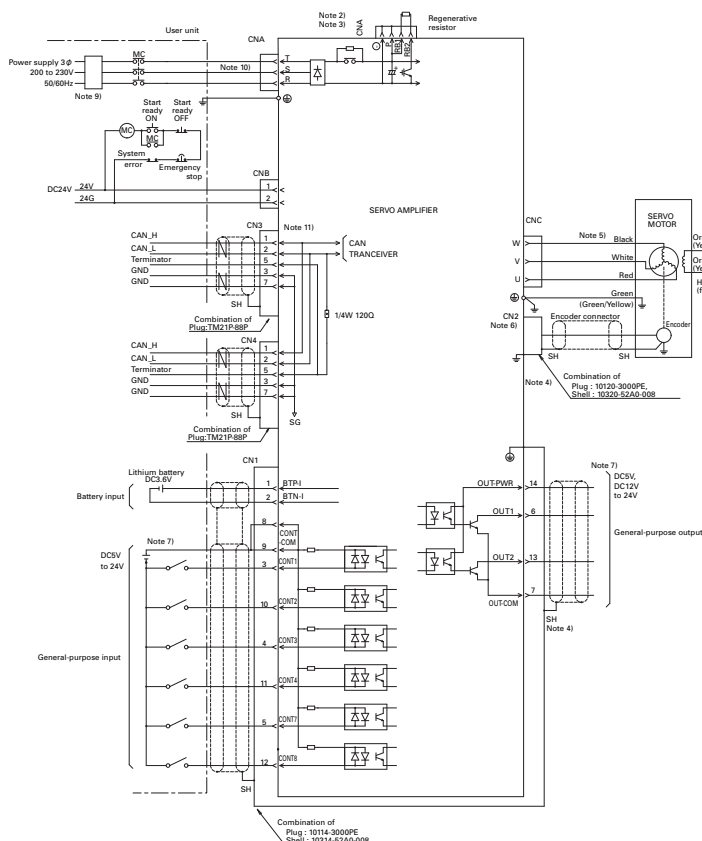
Note 12: Always connect the SG (signal ground) between devices when using differential operation input signals.

Single-Axis Amplifier With CANopen

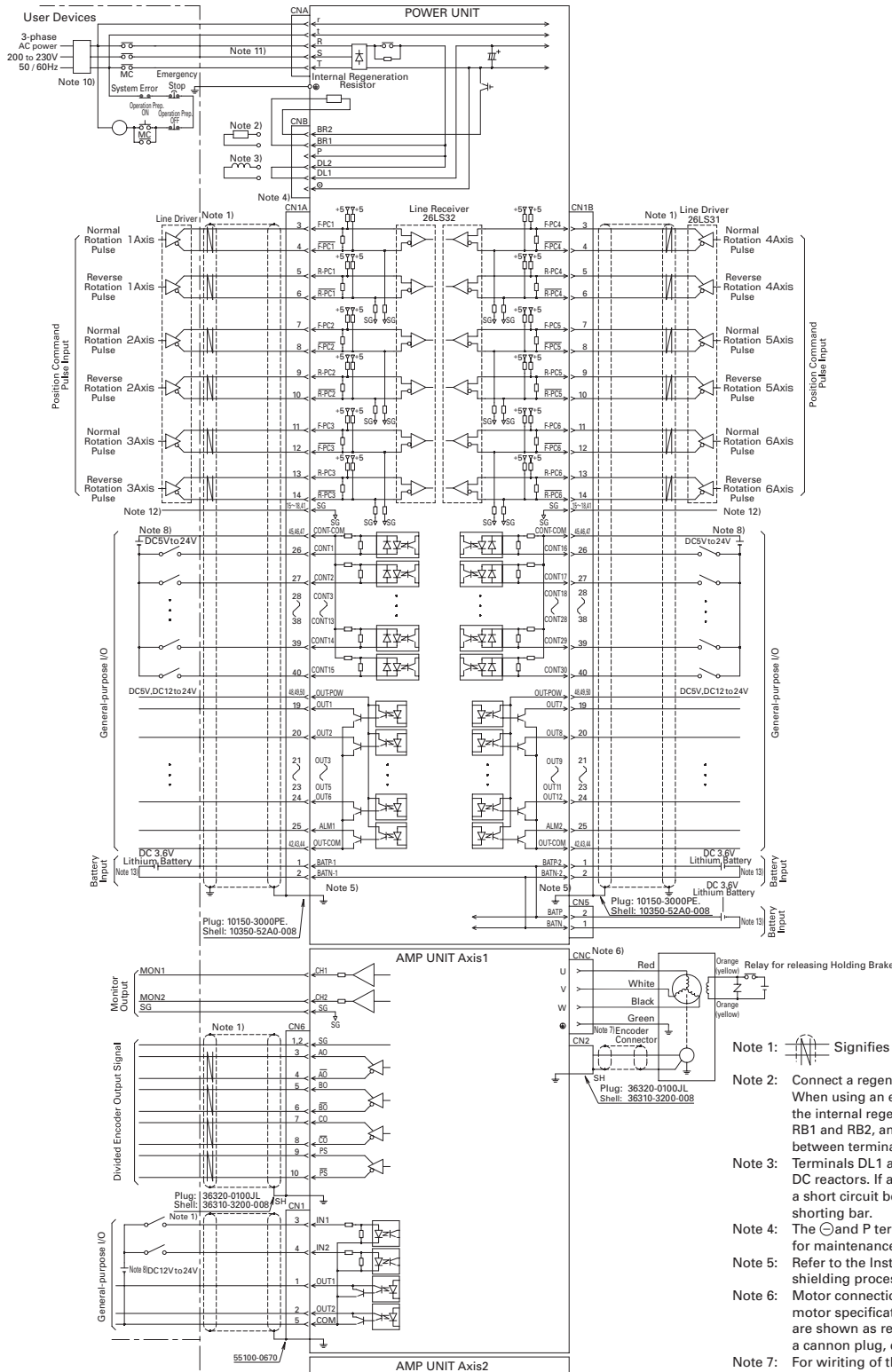
■ Main Power : 200V AC / Control Power : 200V AC



■ Main Power : 200V AC / Control Power : 24V DC



Multi-Axis Amplifier



Note 1: Signifies shielded twisted-pair 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: Terminals DL1 and DL2 are dedicated for connecting DC reactors. If a harmonic suppression reactor is not in use, create a short circuit between DL1 and DL2 terminals with the attached shorting bar.

Note 4: The $\odot$ and P terminals (high-voltage circuit) are reserved for maintenance. Do not wire these terminals.

Note 5: Refer to the Instruction Manual for instructions on the shielding process.

Note 6: Motor connection specifics may vary depending on the motor specifications. Lead-type motor power and brake wires are shown as red, white, black, green, and orange. When using a cannon plug, connect it according to the motor specifications.

Note 7: For wiring of the encoder connectors, refer to the encoder wiring diagram.

Note 8: The user must supply the external power supply.

Note 9: R, S, T, r, t, $\odot$, P, DL2, RB1, RB2, U, V, W are high-voltage circuits; all other signal lines are low-voltage circuits. When wiring, maintain sufficient distance between high-voltage and low-voltage circuits.

Note 10: Installation of a UL compliant and IEC / EN compliant earth leakage circuit breaker is recommended.

Note 11: When wiring the single-phase power supply, do not wire the S-phase to the amplifier.

Note 12: Always connect the SG (signal ground) between devices when using differential operation input signals.

Note 13: The internal battery power is common for all units. Please connect to either CN1A, CN1B or CN5 when using an absolute encoder.

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

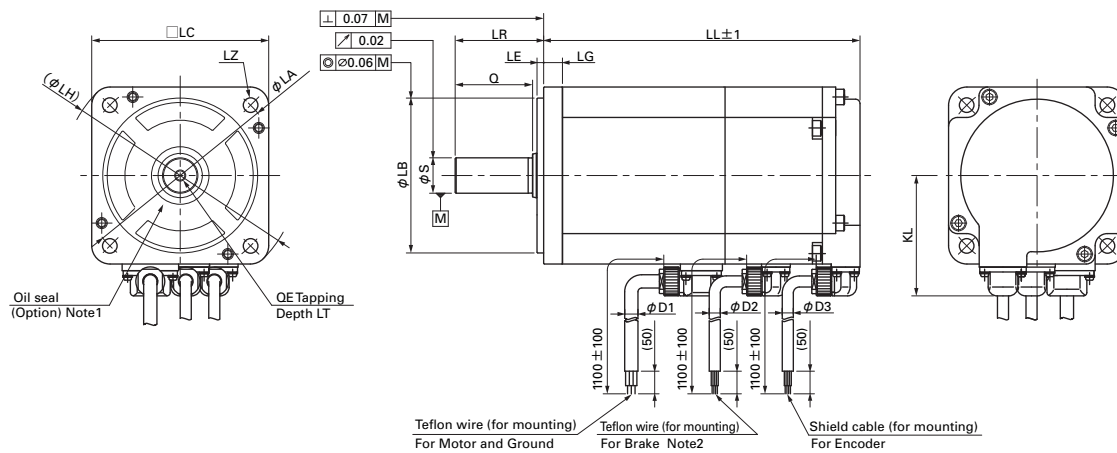
External Wiring Diagram

Dimensions

Setup Software

Optional Equipment

Servo Motor Dimensions (Unit : mm)



*This is shown dimension for motor with brake

R2 motor High Efficiency and Low Ripple (Medium Inertia)

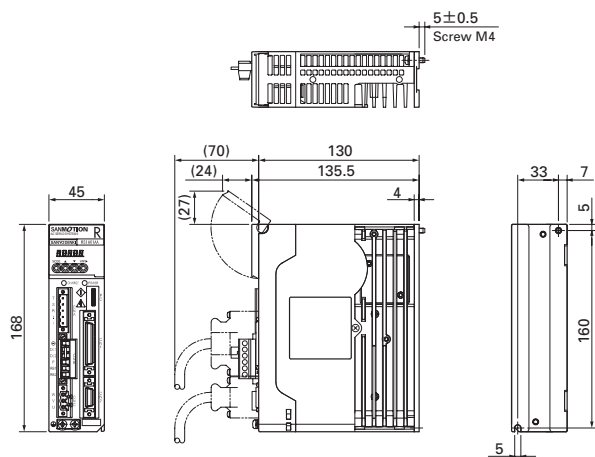
	Absolute																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
--	----------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note 1: If an oil seal is needed ,the overall motor length is different.

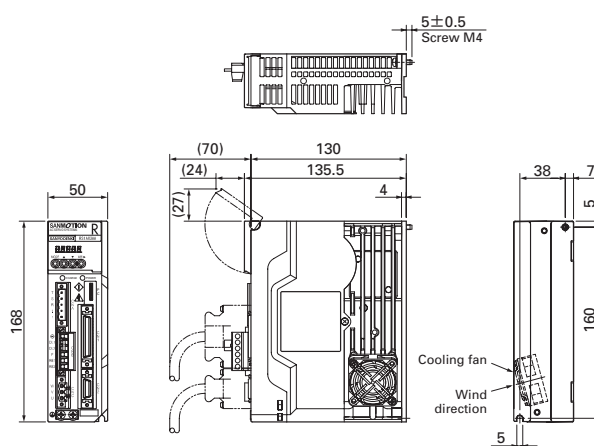
Note 2: Brake connectors (cables) are not supplied for models without brakes.

Single-Axis Amplifier

RS1A01AA (15A)

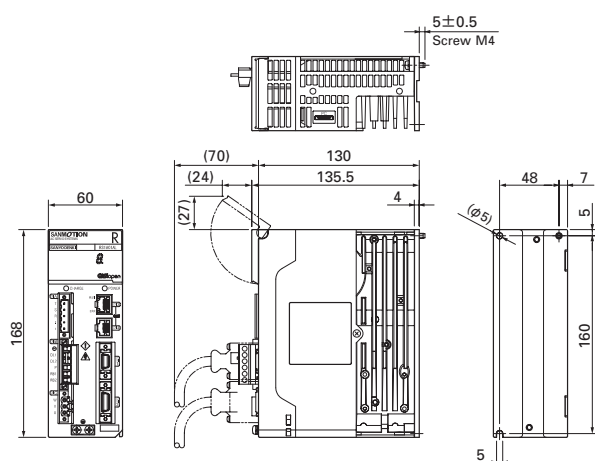


RS1A03AA (30A)

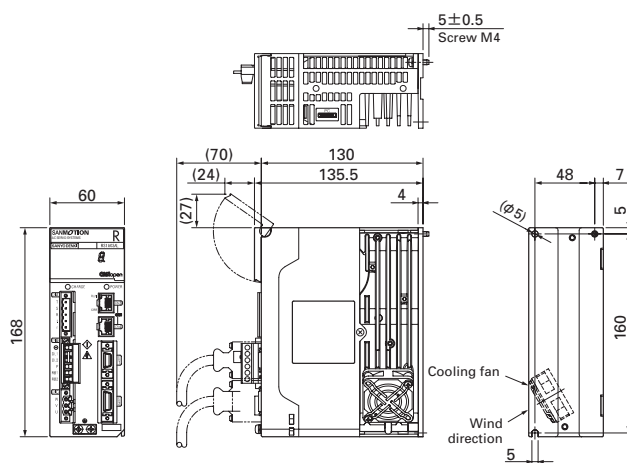


Single-Axis Amplifier With CANopen

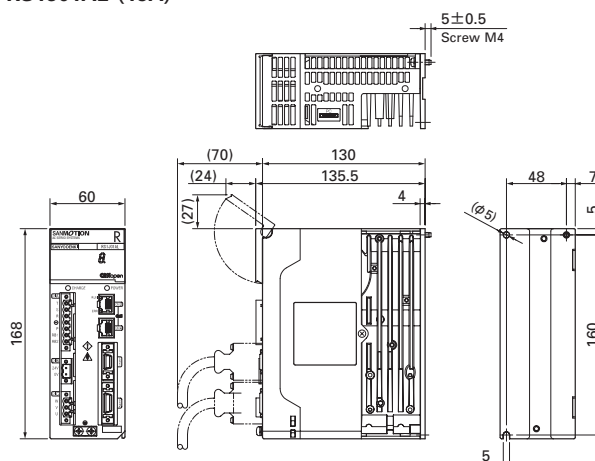
RS1A01AL (15A)



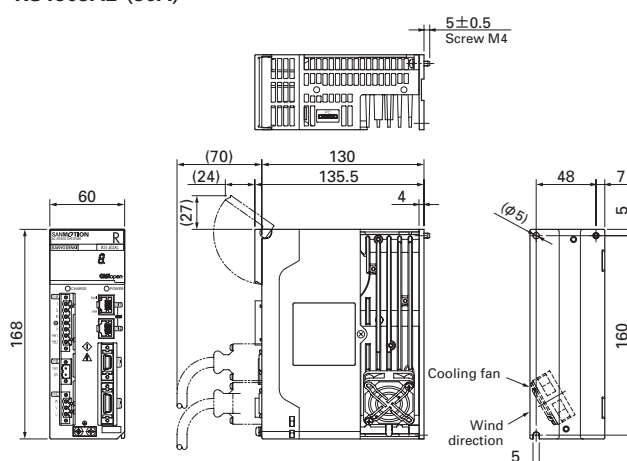
RS1A03AL (30A)



RS1J01AL (15A)



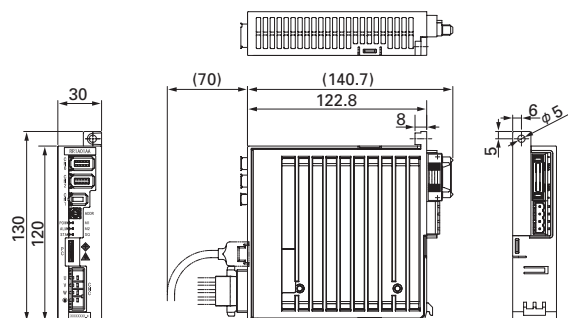
RS1J03AL (30A)



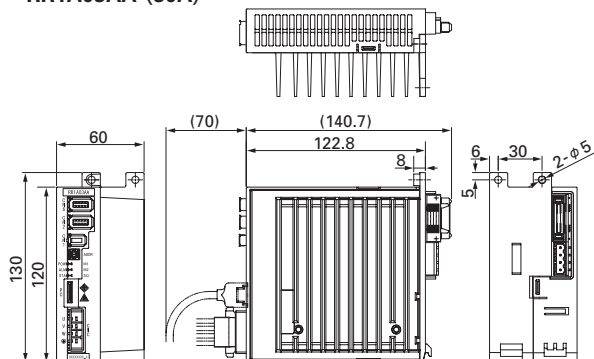
Multi-Axis Amplifier

Amplifier Unit

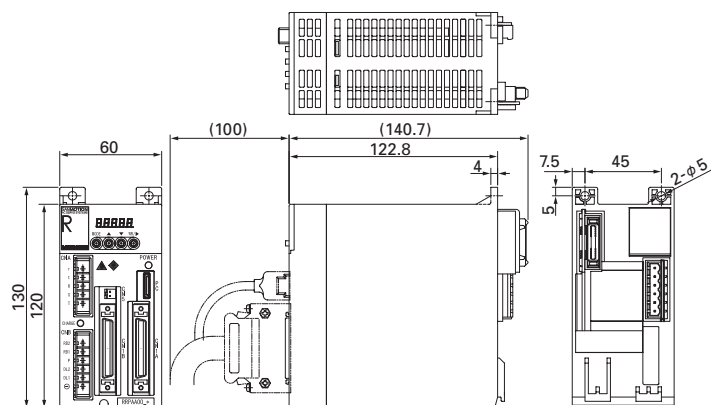
RR1A01AA (15A)



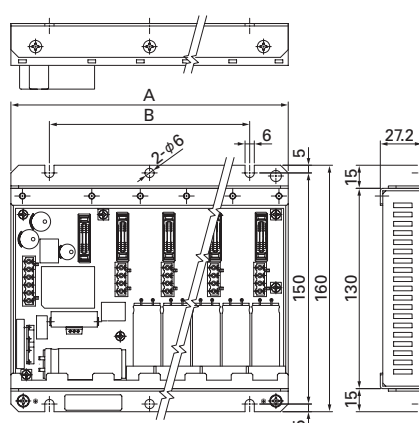
RR1A03AA (30A)



Power Unit

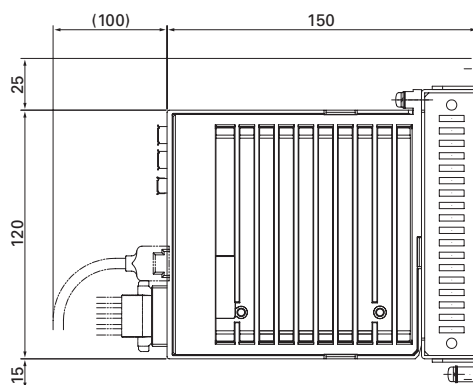
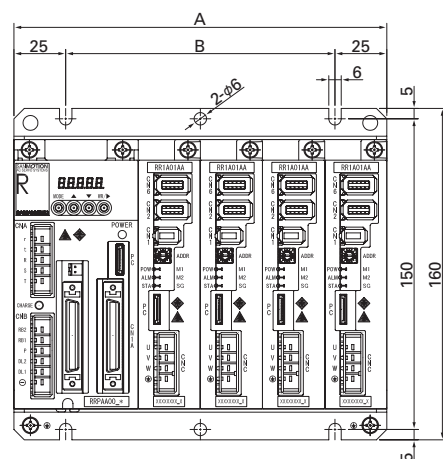


Motherboard



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



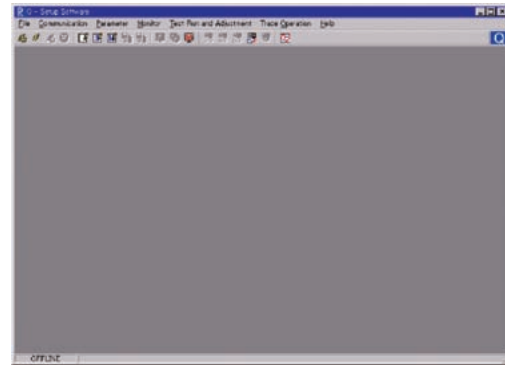
3	8	300	250
2	6	240	190
1	4	180	130
No.	Number of Slots	Supported size	
		A	B

Setup Software

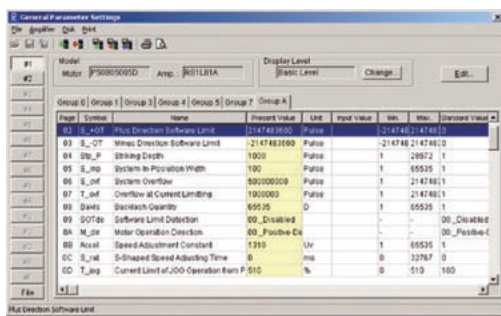
(1) Setup Software Start-up Screen



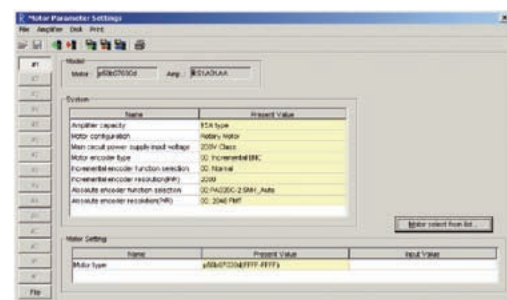
(2) Main Screen



(3) Parameter Configuration Screen

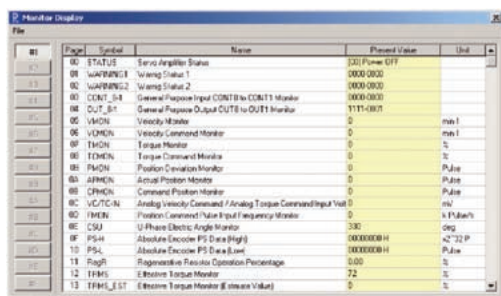


a. Configuration of General Parameters : Enables parameter loading, saving, etc., via PC connection

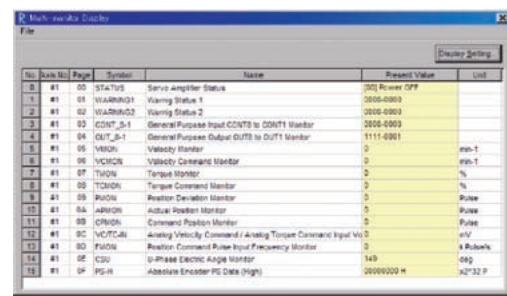


b. Configuration of Motor Parameters : Combined motors can be configured via PC connection

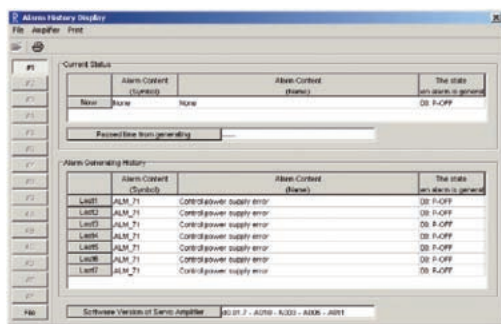
(4) Monitor Functions



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

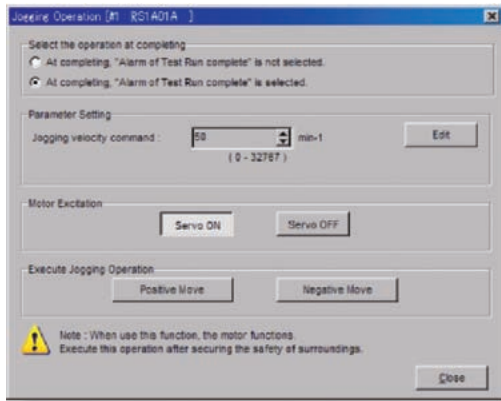
External Wiring Diagram

Dimensions

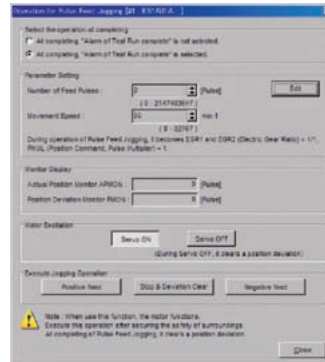
Setup Software

Optional Equipment

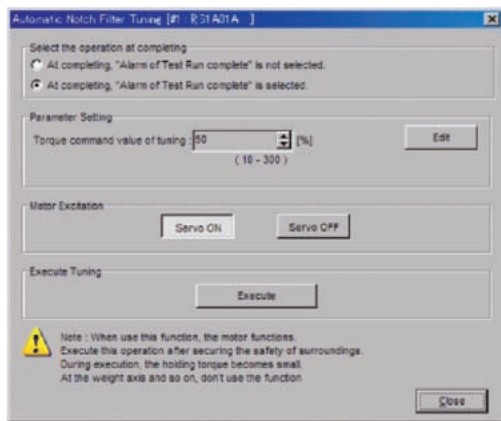
(5) Test Run and Adjustment Function



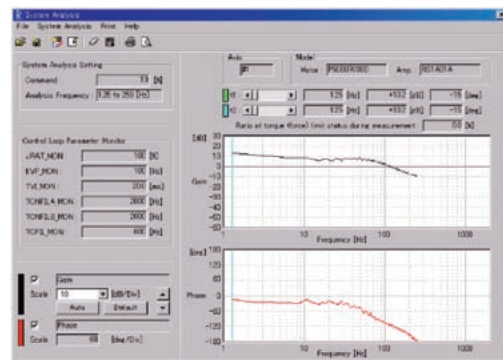
a. Speed Jog : Simplifies motor operation and the issuing of speed commands from a PC



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

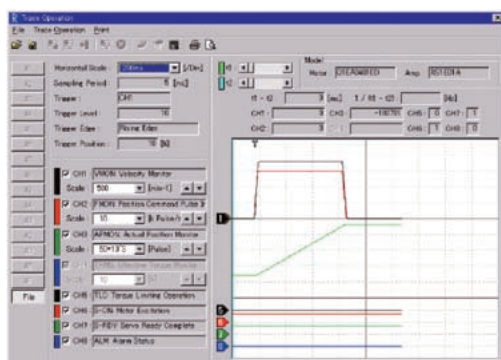


c. Auto Notch Filter Tuning : Configures the appropriate notch filter settings



d. System Analysis : Analyzes servo system frequency characteristics

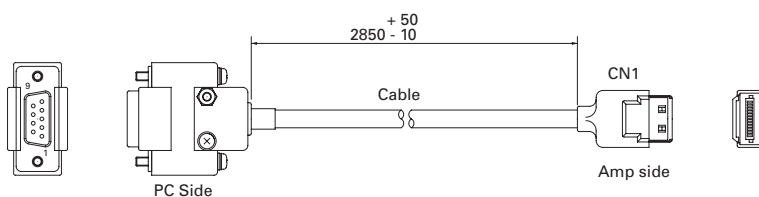
(6) Operation Trace Function



Graphically displays servo motor speed, current, and terminal status

Optional Equipment

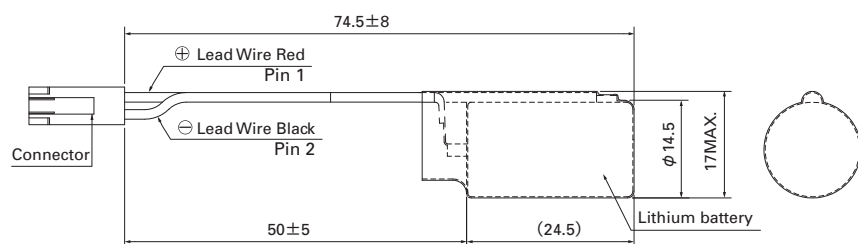
PC Interface Cable [Unit: mm]



Model No.:AL-00490833-01

A note regarding RS-232C communications:
The user must provide a PC for computer interface.
Parameter settings may require adjustment.

Lithium battery [Unit: mm]



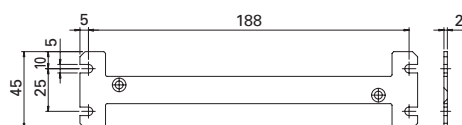
Model No. : AL-00494635-01

Mass : 0.02kg

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

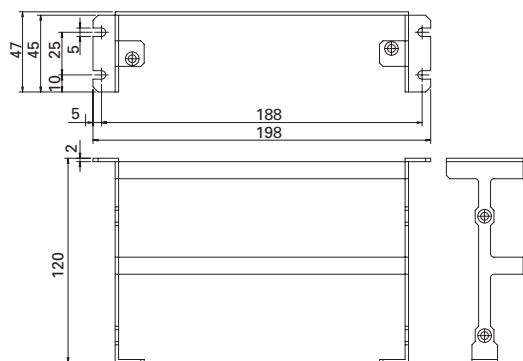
Applicable Amplifiers:RS1 * 01 * * *

Applicable Amplifiers:RS1 * 03 * * *

Material:SPCC

15A

Front Side



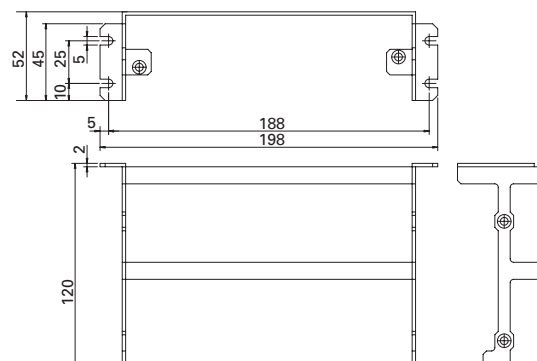
For mounting on the front side of the amplifier

Model No.:AL-00582788-01 Material:SPCC

Applicable Amplifiers:RS1 * 01 * * *

30A

Front Side



For mounting on the front side of the amplifier

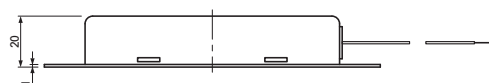
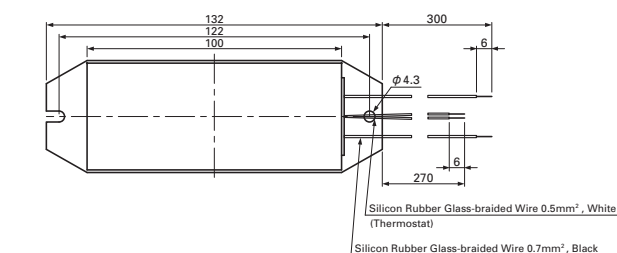
Model No.:AL-00582789-01 Material:SPCC

Applicable Amplifiers:RS1 * 03 * * *

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

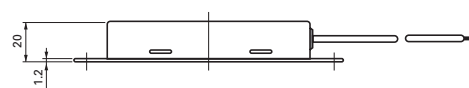
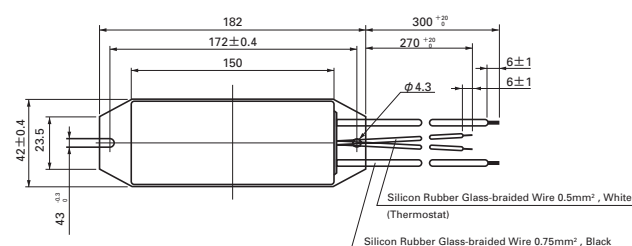
Optional Equipment

External Regenerative Resistor Dimensions [Unit: mm]



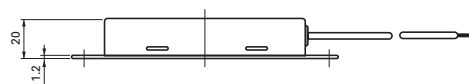
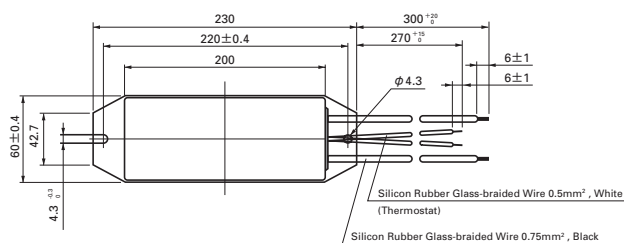
Mass : 0.19kg

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



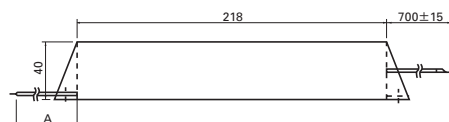
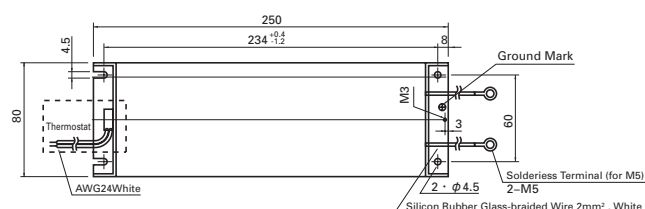
Mass : 0.24kg

	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
4	REGIST-220W20B	Normal close



Mass : 1.4kg

	Model No.	A	Thermostat
1	REGIST-500W20B	350 ± 15	Thermostat, B-contact
2	REGIST-500W20		No

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

Usage	Contents	Model No.	Manufacturer	Manufacturer's Part No.
Single Connectors	CN1 (Plug, Housing)	AL - 00385594	Sumitomo 3M	10150-3000VE+10350-52A0-008
	CN2 (Plug, Housing)	AL - 00385596		10120-3000VE+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	10150-3000VE+10350-52A0-008 10120-3000VE+10320-52A0-008 MSTB2.5/5-STF-5.08 IC2.5/3-STF-5.08
	CN1,CN2 (Plug, Housing)	AL - 00292309	Sumitomo 3M	10150-3000VE+10350-52A0-008 10120-3000VE+10320-52A0-008

Connectors for Amplifier with CANopen

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

Usage	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

Usage	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 Amplifier Connections

Usage	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)		04JFAT-SBXGF-I J-FATOT
	Power Unit	CNA (Plug)	J.S.T.Mfg.CO.,LTD	05JFAT-SBXGF-I J-FATOT
		CNB (Plug) : Accessory		06JFAT-SBXGF-I J-FATOT
		CN1A (Plug, Housing)	Sumitomo 3M	10150-3000PE
		CN1B (Plug, Housing)		10350-52A0-008
Connector Sets	Amplifier Unit	CN1,CN2 (Plug, Housing) CN6,CNC (Plug)	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)	Sumitomo 3M	10150-3000PE 10350-52A0-008
			J.S.T.Mfg.CO.,LTD	05JFAT-SBXGF-I

Handwriting practice lines consisting of multiple sets of three horizontal dashed lines for tracing and writing practice.

Blank area for drawing or notes, consisting of horizontal dashed lines.

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

Setup Software

Optional Equipment

Handwriting practice lines consisting of 25 sets of three horizontal dashed lines.

Inquiry Check Sheet

Please provide the following information when placing an order or making an inquiry.
Also feel free to include any questions that require our attention.

Company Name : _____

Date : _____

Department : _____

To contact us : _____

Telephone : _____

Phone : +81 3 3917 5157

Fax : _____

FAX : +81 3 3917 0643

1) Application : _____

2) Name of Machinery : _____

3) Number of Units : _____

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	Acceleration α : G · [m/s²] Feeding Speed V : [m/s] Moving Distance D : [m] (Stroke) Time [sec] [Reference formula] $1G=9.8[m/s^2]$, $1[m/s^2] \div 0.1G$ $\alpha [m/s^2] = V[m/sec] \div t1[sec]$ $D[m] = V[m/sec] \times (t1+t2)[sec]$																																																																																							
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	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">WT (table mass)</td> <td style="width: 10%;">kg</td> <td style="width: 33%;">WL (work mass)</td> <td style="width: 10%;">kg</td> <td style="width: 14%;">WA (mass of other drive parts)</td> <td style="width: 10%;">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> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Lr1 (drive-side roll length)</td> <td style="width: 10%;">mm</td> <td style="width: 33%;">Lr2 (follower-side roll length)</td> <td style="width: 10%;">mm</td> <td style="width: 14%;">G (reduction ratio)</td> <td style="width: 10%;"></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> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Dp (pinion/pulley diameter)</td> <td style="width: 10%;">mm</td> <td style="width: 33%;">Lp (pinion axial length)</td> <td style="width: 10%;">mm</td> <td style="width: 14%;">tp (pulley thickness)</td> <td style="width: 10%;">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> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">μ (friction coefficient between sheet and shilding-surface/support-section/roll)</td> <td style="width: 33%;">ρ1 (specific gravity of roll-1 material)</td> <td style="width: 34%;">kg/cm³</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> </tr> <tr> <td>η (mechanical efficiency)</td> <td></td> <td>JL (load inertia of motor-axis conversion)</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> </tr> <tr> <td></td> <td></td> <td>N · m</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)	TF (friction torque of motor axis conversion)	N · m	Tu (imbalance torque of motor axis conversion)			N · m
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)																																																																																						
TF (friction torque of motor axis conversion)	N · m	Tu (imbalance torque of motor axis conversion)																																																																																						
		N · m																																																																																						
⑧	Speed reducer Customer-provided (/) · *Sanyo standard(planet/spur/no-backlash-planet /) other(/)																																																																																							
⑨	Encoder type Encoder type specified (yes / no) Yes: (incremental , optical absolute , optical absolute [resolver absolute with incremental function]) Resolution ()																																																																																							
⑩	Input format Position , velocity , torque , communications (SERCOS / CAN / DeviceNet) other ()																																																																																							
⑪	Host equipment (controller) Sequencer , laptop , customer-developed product , Sanyo-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.)																																																																																							

* Please consult us on selecting suitable reduction gears for your application.

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.

■ 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.

<http://www.sanyodenki.com>

SANYO DENKI CO., LTD.

1-15-1, Kita-Otsuka, Toshima-ku, Tokyo 170-8451, Japan

Phone: +81 3 3917 5157

SANYO DENKI AMERICA, INC.

468 Amapola Avenue Torrance, CA 90501 U.S.A.

Phone: +1 310 783 5400

SANYO DENKI EUROPE SA.

P.A. Paris Nord II 48 Allee des Erables-VILLEPINTE BP.57286 F-95958 ROISSY CDG Cedex France

Phone: +33 1 48 63 26 61

SANYO DENKI GERMANY GmbH

Frankfurter Strasse 63-69 65760 Eschborn Germany

Phone: +49 6196 76113 0

SANYO DENKI KOREA CO., LTD.

9F 5-2, Sunwha-dong Jung-gu Seoul, 100-130, Korea

Phone: +82 2 773 5623

SANYO DENKI SHANGHAI CO., LTD.

Room 2116, Bldg B, FAR EAST INTERNATIONAL PLAZA, No.317 XianXia Rd., Shanghai 200051 China

Phone: +86 21 6235 1107

SANYO DENKI TAIWAN CO., LTD.

Room 1208, 12F, No.96 Chung Shan N. Rd., Sec.2, Taipei 104, Taiwan, R.O.C.

Phone: +886 2 2511 3938

SANYO DENKI (H.K.) CO., LIMITED

Room 2305, 23/F, South Tower, Concordia Plaza, 1 Science Museum Rd., TST East, Kowloon, Hong Kong

Phone: +852 2312 6250

SANYO DENKI SINGAPORE PTE. LTD.

10 Hoe Chiang Road #14-03A/04 Keppel Towers Singapore 089315

Phone: +65 6223 1071

The names of companies and/or their products specified in this catalogue are the trade names, and/or trademarks and/or registered trademarks of such respective companies.

*Remarks : Specifications Are Subject To Change Without Notice.

CATALOG NO. 839-8 '08.1.N