SANMOTION

AC SERVO SYSTEMS

R

SANYO DENKI

English

SANMOTION R
AC SERVO SYSTEMS

CONCEPT 1

Easy Set-up for Optimal Operation

CONCEPT 2

Improved Precision and Reduced Cycle Time

CONCEPT 3

Reduced Running Costs

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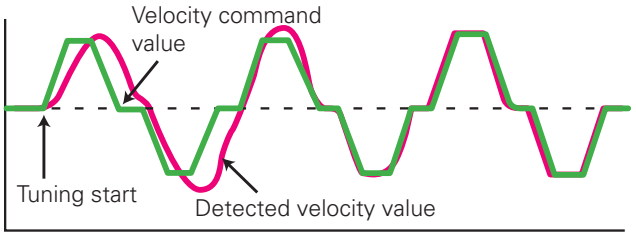
CONCEPT 1

Easy Set-up for Optimal Operation

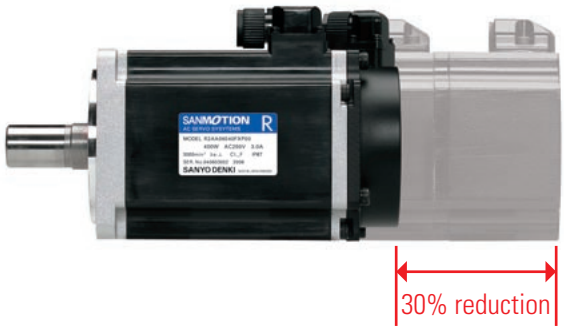
Auto-Tuning

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



Small Compact Servomotors

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



Multi-Axis Servo Amplifier

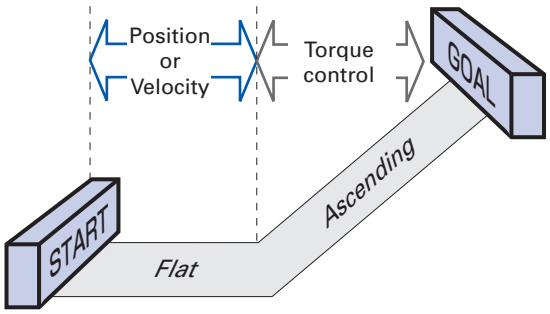
High performance modular servo amplifier can control up to six-axis and reduce installation width by as much as 42% compared to current single-axis models. Also designed to reduce system wiring.

Water Protection

The SANMOTION R Series has IP67 protection for improved endurance in adverse operating environments.

All-in-One Control

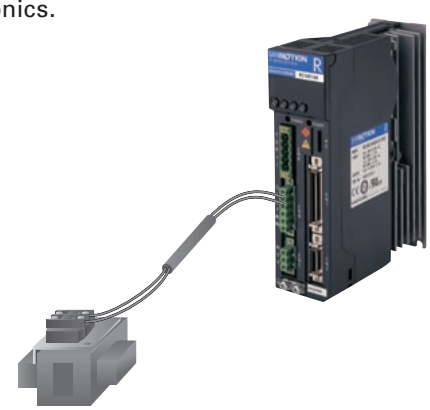
User configurable parameters allow you to switch between control modes for torque, position or velocity.



*available for single-axis only

Power Supply Harmonic Suppression

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



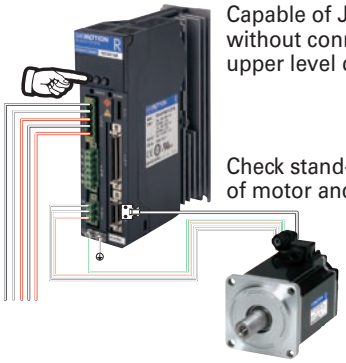
5-digit LED Display, Built-in Operator

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

*Multi-axis monitoring, alarm tracing and parameter setting 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 an upper-level device.



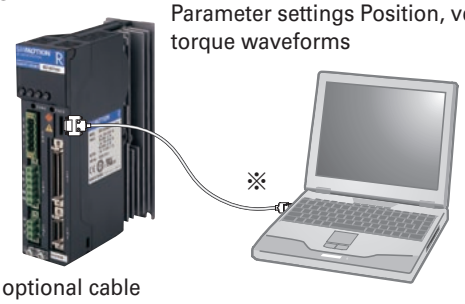
Capable of JOG operation without connecting to an upper level device

Check stand-alone operation of motor and amplifier

*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.



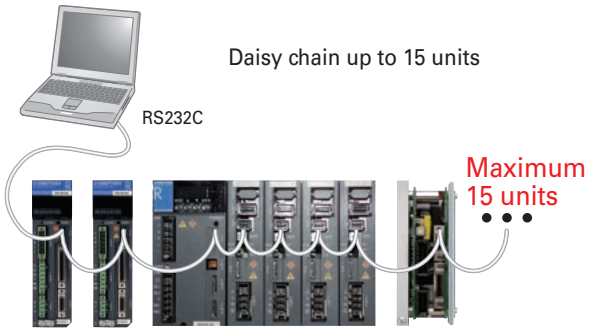
Parameter settings Position, velocity, torque waveforms

※

*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.



Daisy chain up to 15 units

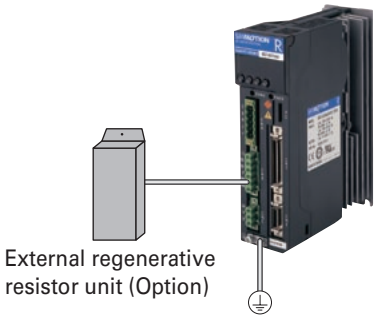
RS232C

Maximum 15 units

*PC connection cable is optional

Built-in Regeneration Resistor

An optional 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.

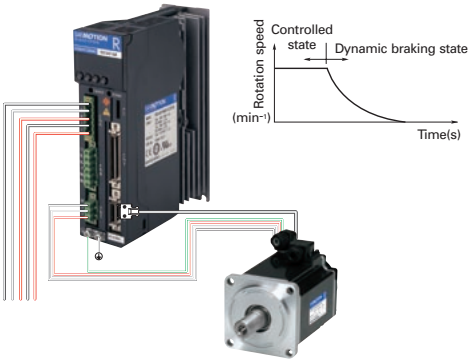


Built-in Regeneration Resistor

External regenerative resistor unit (Option)

Built-in Dynamic Brake

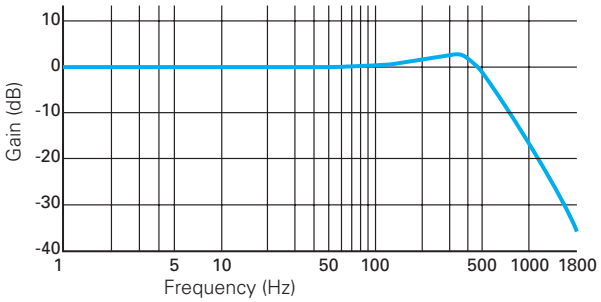
A built-in dynamic brake provides emergency stop capability. The motion sequence for the dynamic brake can be selected by parameter setting.



CONCEPT 2 Improved Precision and Reduced Cycle Time

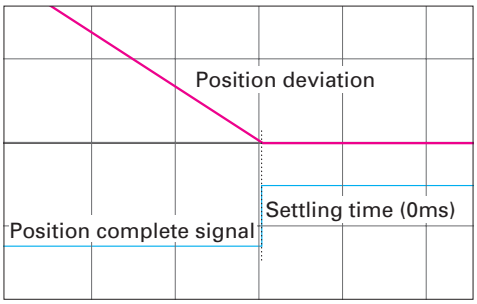
High Response

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



Shorter Position Settling Time

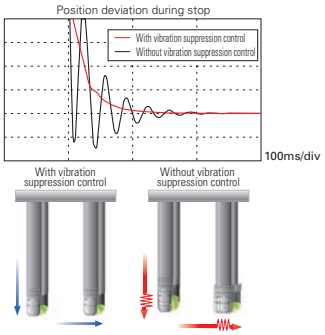
A new algorithm drastically shortens positioning settling time for equipment.



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

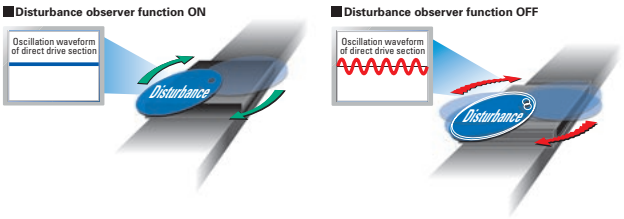
Vibration Suppression Control

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.



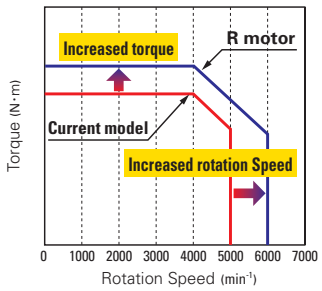
Disturbance Suppression

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



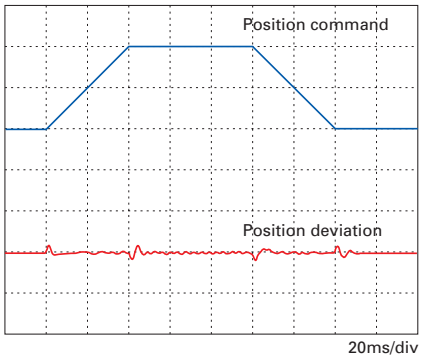
Expanded Power Range

The newly redesigned magnetic circuitry delivers higher instantaneous stall torque and rotation speed for a wider 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

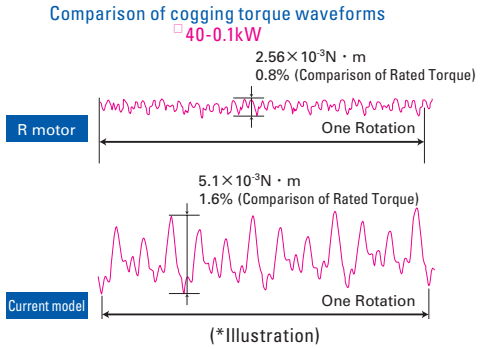
Employing new positioning and velocity control units, positioning follow-up control is increased by 2 times compared to current models, and position deviation ≒0 is achieved.



CONCEPT 3 Reduced Running Costs

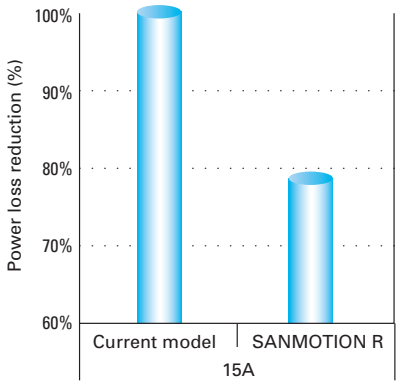
Low Cogging Torque

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.



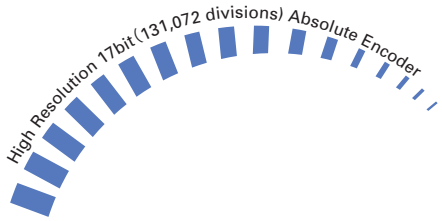
20% Reduction in Power Loss

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



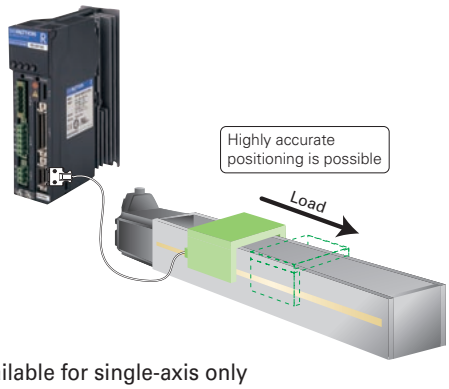
High Resolution

Support for encoders up to a maximum of 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 load side.

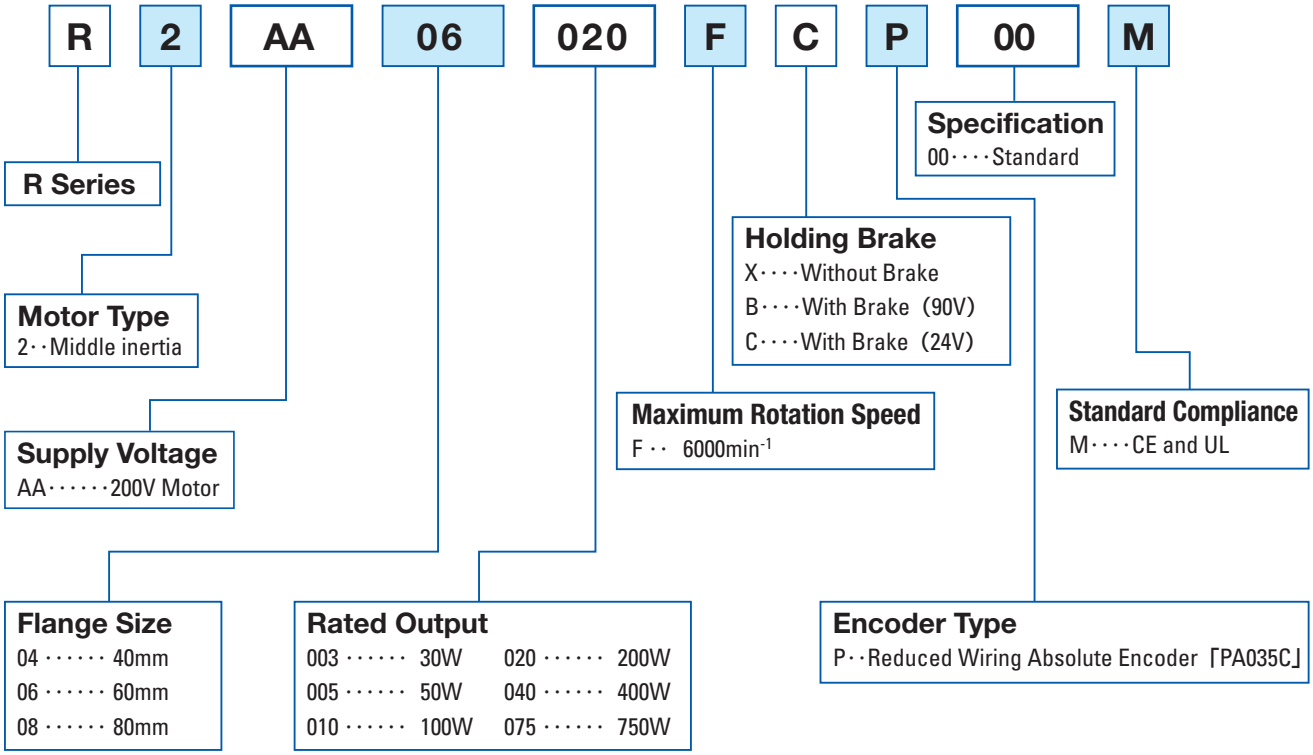


*available for single-axis only

Servo Motor Model Number Nomenclature

Servo Motor

Example: The part number shown below is a UL/CE compliant "R2" servomotor with 60mm flange size, 200W rated output, 6000min^{-1} maximum rotation speed, 24V brake, and an absolute encoder (131,072 divisions/rotation).



Encoder Specification

Absolute Encoder

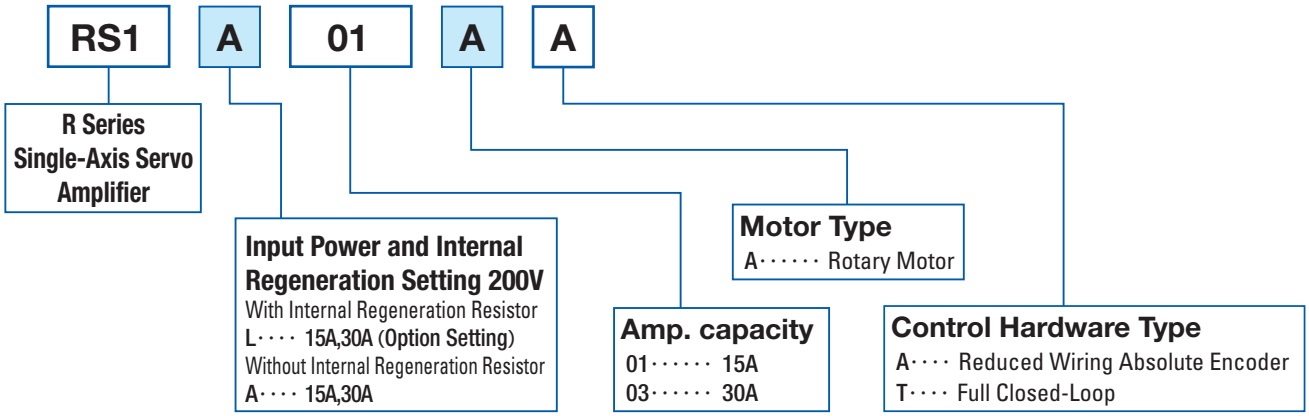
Model			Standard		Flange Size	Remarks
			Per rotation	Multiple Rotations	Dimension	
PA035C	Optical Detection System	Absolute Type	131072(17bit)	65536(16bit)	40mm MIN.	Reduced Wiring Absolute

Note) With battery backup
Please contact our sales department for information on the specifications of the 1,048,576(20 bit) model.

Servo Amplifier Model Number Nomenclature

Single-Axis Servo Amplifier

Example: The model number shown below is "R" Series Servo Amplifier with AC200V input voltage and 15A amplifier capacity.

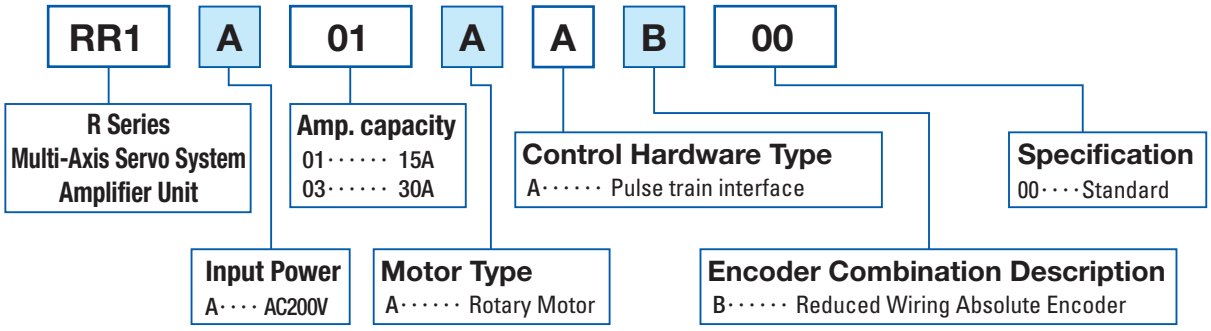


Multi-Axis Servo Amplifier

Example: The model number shown below is a 4-axis "R" series multiaxis servo amplifier configuration with AC200V input voltage, 2 units of 15A amplifiers, 2 units of 30A amplifiers, and pulse train interface.
* The width of one unit of the 30A amplifier is equivalent to two units of the 15A amplifier.

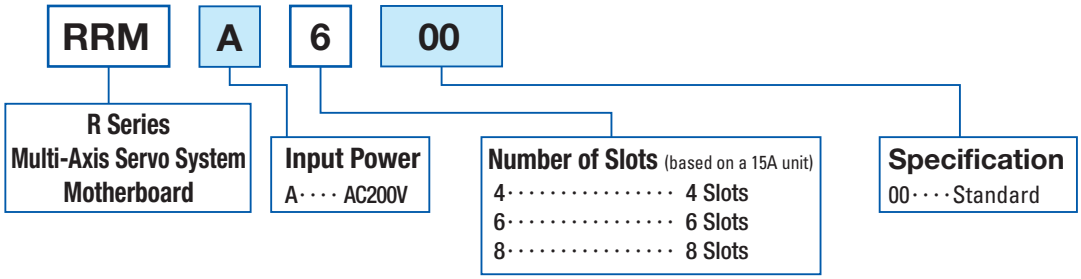
Amplifier Unit	RR1A01AAB00 × 2 units
	RR1A03AAB00 × 2 units
Power Unit	RRPAA00 × 1 units
Motherboard	RRMA600 × 1 units

Amplifier Unit

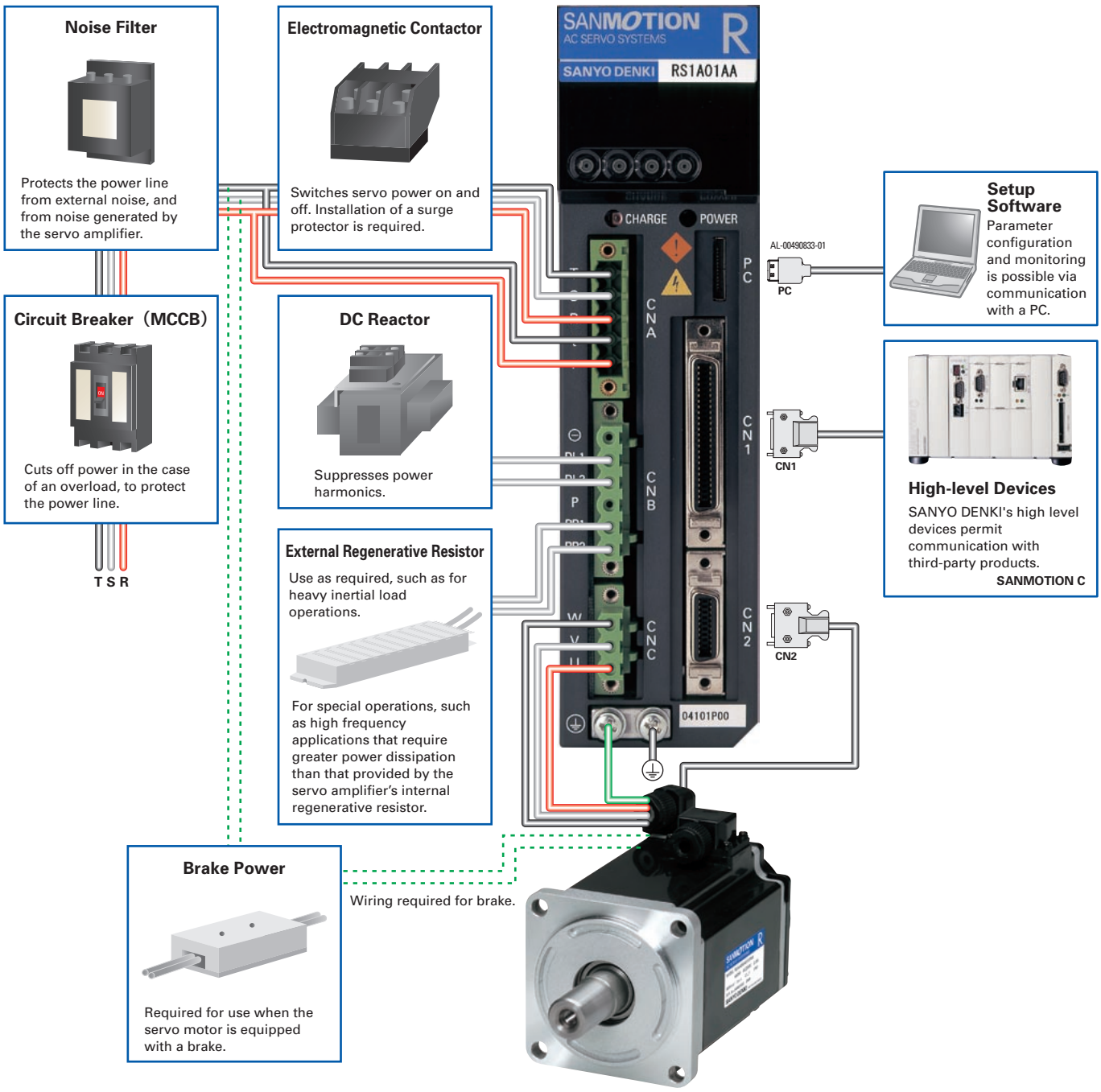


Power Unit

Motherboard



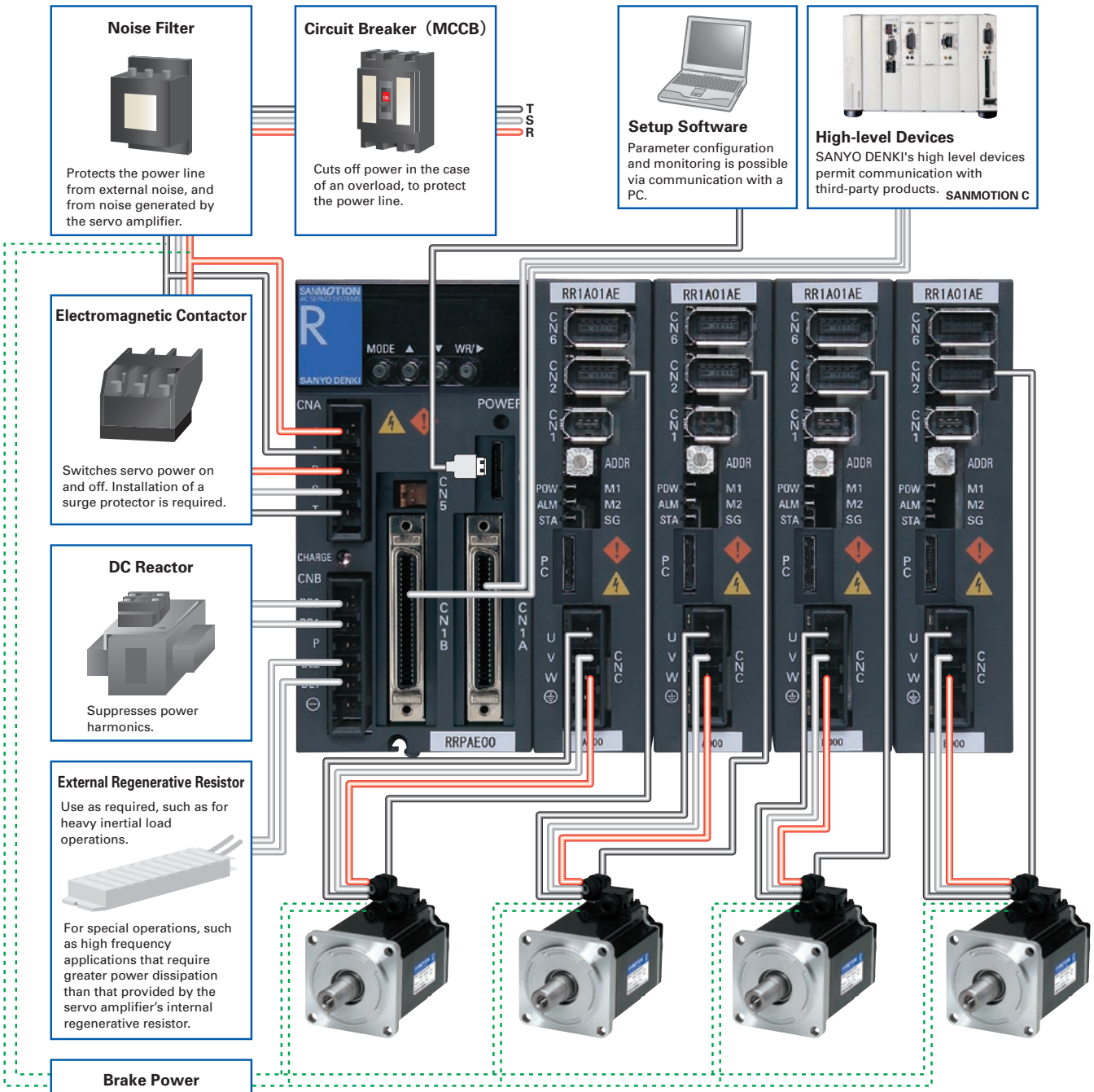
Single-Axis Specification



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

Multi-Axis Specification



Connectors for Multi-Axis Amplifier Connections

	Contents		Model No.
Single Connectors	Amplifier Unit	CN1 (Plug, Housing)	AL-Y0003305-1
		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	AL-00385594
		CN1B	AL-00385594
Connector Sets	Amplifier Unit	CN1,CN2 (Plug, Housing) CN6,CNC (Plug)	AL-00632611
	Power Unit	CNA (Plug) CN1A,CN1B	AL-00632609

Standard Specifications

R2

Servo Motor

200V System

Capacity

□40mm to □80mm
30W to 750W
(7 models)

Features

High Efficiency and Low Ripple (Medium Inertia)

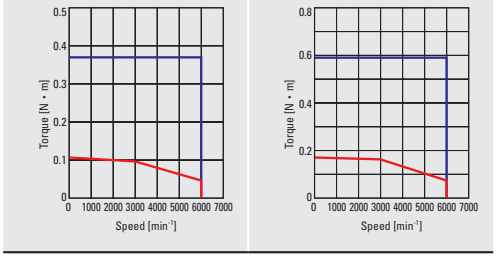
Motor Dwgs P15

★: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℃.

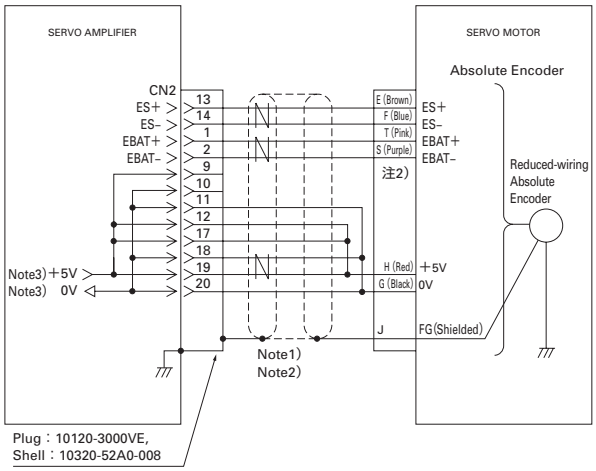
Motor Model and Flange Dimension in mm	Status	Symbol	Unit	R2AA04003F 《40》	R2AA04005F 《40》
Rated Output	★	P_R	kW	0.03	0.05
Rated Rotation Speed	★	N_R	min^{-1}	3000	
Max. Rotation Speed	★	N_{max}	min^{-1}	6000	
Rated Torque	★	T_R	N·m	0.098	0.159
Continuous Stall Torque	★	T_S	N·m	0.108	0.167
Inst. Max. Stall Torque	★	T_P	N·m	0.37	0.59
Rated Armature Current	★	I_R	Arms	0.51	0.67
Continuous Stall Armature Current	★	I_S	Arms	0.56	0.69
Instant. Max. Stall Armature Current	★	I_P	Arms	2.15	2.8
Torque Constant	☆	K_T	N·m／Arms	0.201	0.246
Voltage Constant Per-Phase	☆	$K_{E\phi}$	mV／min^{-1}	7	8.6
Phase Armature Resistance	☆	R_ϕ	Ω	12	9
Rated Power Rate	★	Q_R	kW／s	3.9	6.7
Electrical Time Constant	☆	te	ms	0.55	0.67
Mechanical Time Constant (not including Encoder)	☆	tm	ms	2.2	1.7
Rotor Moment of Inertia (not including Encoder)		J_M	$\times10^{-4}kg{\cdot}m^2(GD^2/4)$	0.0247	0.0376
Serial Absolute Encoder			P／R	17 bit Standard (2^{17}=131072P/R)	
Absolute Encoder Inertia		J_S	$\times10^{-4}kg{\cdot}m^2(GD^2/4)$	0.0054	
Mass including Encoder		WE	kg	0.23	0.27
Brake Static Friction Torque		TB	N·m	0.32 MIN.	
Brake Rated Torque		VB		DC90V ／ DC24V ± 10%	
Brake Consumption Current		IB	A	0.07 ／ 0.27	
Brake Inertia		JB	$\times10^{-4}kg{\cdot}m^2(GD^2/4)$	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)				**RS1A01**	
Amplifier Model (Multi-Axis)				**RR1A01**	
Amplifier Power Supply				AC200V ～ 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	
Amplifier Mass			kg	0.9	

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



Encoder Wiring Diagram

Single-Axis Specification



Reduced-wiring Absolute Encoder [PA035C]
Cannon plug and lead-wire types

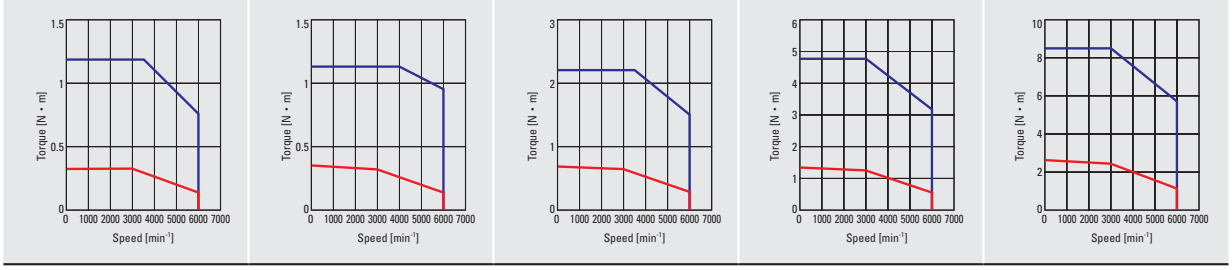
Note 1) Use a twisted-pair shielded cable.

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

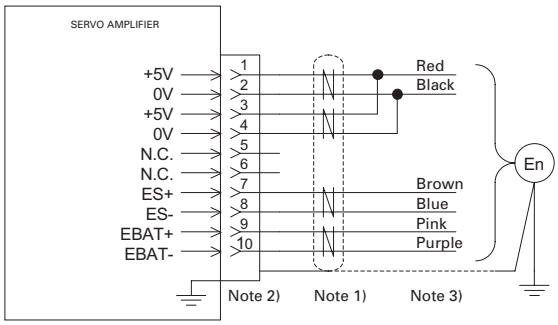
Encoder cable length	10m MAX.	25m MAX.	40m MAX.
+5V DC Wiring	Connect pin 19 (Do not connect pins12,17)	Connect pin 17,19 (Do not connect pins12)	Connect pin 12,17,19
0V DC Wiring	Connect pin 20 (Do not connect pins11,18)	Connect pin 18,20 (Do not connect pins11)	Connect pin 11,16,18,20

Note 3) Use a 0.2mm² encoder cable

R2AA04010F 《40》	R2AA06010F 《60》	R2AA06020F 《60》	R2AA06040F 《60》	R2AA08075F 《80》	記号	単位
0.1	0.1	0.2	0.4	0.75	P_R	kW
3000					N_R	min^{-1}
6000					N_{max}	min^{-1}
0.318	0.318	0.637	1.273	2.39	T_R	N·m
0.318	0.353	0.686	1.372	2.55	T_S	N·m
1.18	1.13	2.2	4.8	7.5	T_P	N·m
0.81	0.86	1.5	2.8	4.6	I_R	Arms
0.81	0.86	1.6	2.8	4.6	I_S	Arms
3.3	3.5	5.6	10.8	15.5	I_P	Arms
0.424	0.375	0.476	0.524	0.559	K_T	N·m／Arms
14.8	13.1	16.6	18.3	19.5	$K_{E\phi}$	mV／min^{-1}
9.3	4.8	2.7	1.36	0.4	R_ϕ	Ω
16	8.6	19	39	31	Q_R	kW／s
0.82	2.0	2.6	3.2	3.0	te	ms
0.97	1.2	0.78	0.61	0.70	tm	ms
0.0627	0.117	0.219	0.412	1.82	J_M	$kg·m^2×10^{-4}(GD^2/4)$
17 bit Standard（2^{17}=131072P/R）						P／R
0.0054						
0.39	0.59	0.84	1.3	2.6	WE	kg
0.32 MIN.	0.36 MIN.	1.37 MIN.		2.55 MIN.	TB	N·m
DC90V ／ DC24V ± 10%					VB	V
0.07 ／ 0.27		0.11 ／ 0.32		0.12 ／ 0.37	IB	A
0.0078	0.060			0.25	JB	$kg·m^2×10^{-4}(GD^2/4)$
0.23	0.30	0.35		0.85	W	kg
Operating Temperature: 0 to 40° C, Relative Humidity: 90% maximum, no condensation						
RS1A01			**RS1A03**			
RR1A01			**RR1A03**			
AC200V ～ 230V +10, −15% 50/60Hz ± 3Hz						
Operating Temperature: 0 to 55° C (Note), Relative Humidity: 90% maximum, no condensation						
0.2			—			kVA
0.9			1.0			kg



Multi-Axis Specification



Reduced-wiring Absolute Encoder [PA035C]

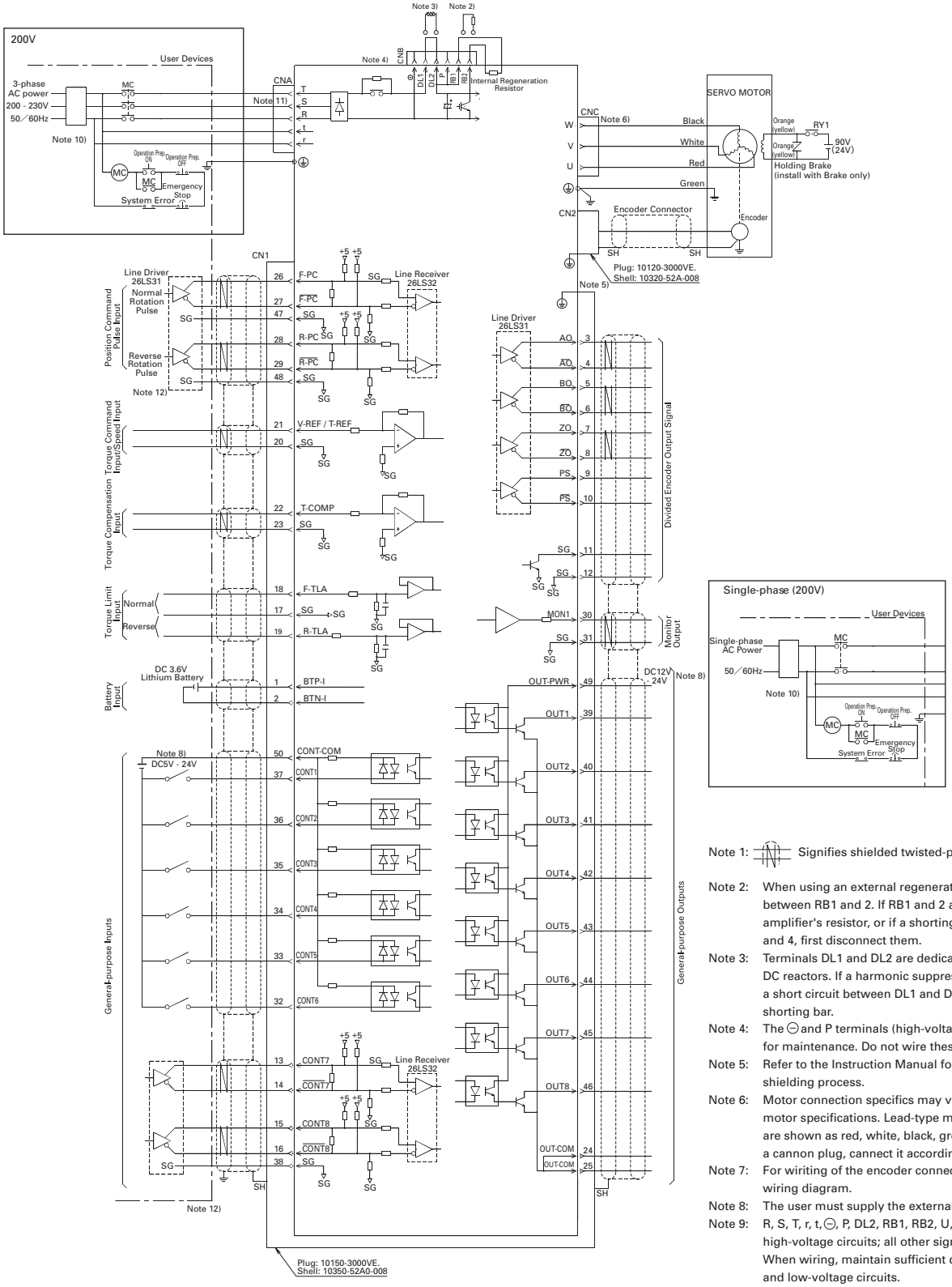
Note 1) Use a twisted-pair shielded cable.

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 is5V±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.

Single-Axis Specification



Note 1: Signifies shielded twisted-pair cable.

Note 2: When using an external regeneration resistor, connect it between RB1 and 2. If RB1 and 2 are connected to the internal amplifier's resistor, or if a shorting bar is connected between RB1 and 4, first disconnect them.

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 ⊖ 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, cannect it according to the motor specifications.

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

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

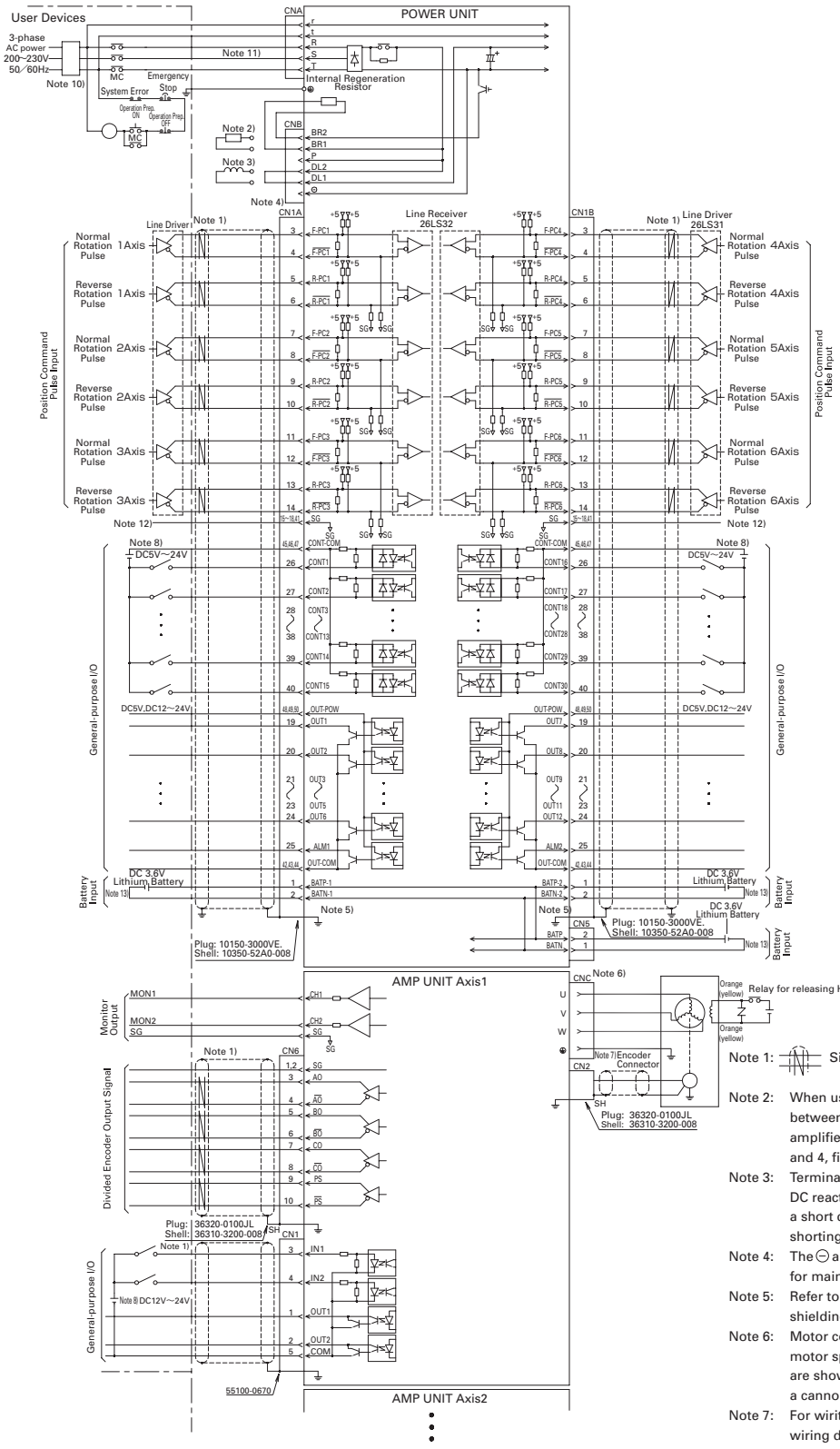
Note 9: R, S, T, r, t, ⊖, P, DL2, RB1, RB2, U, V, W are high-voltage circuits; all other signal lines are low-voltage circuits. When wiring, maintain sufficient distance between high-voltage and low-voltage circuits.

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

Multi-Axis Specification



Note 1: Signifies shielded twisted-pair cable.

Note 2: When using an external regeneration resistor, connect it between RB1 and 2. If RB1 and 2 are connected to the internal amplifier's resistor, or if a shorting bar is connected between RB1 and 4, first disconnect them.

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 ⊖ 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, cannect it according to the motor specifications.

Note 7: For wiriting 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, ⊖, 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.

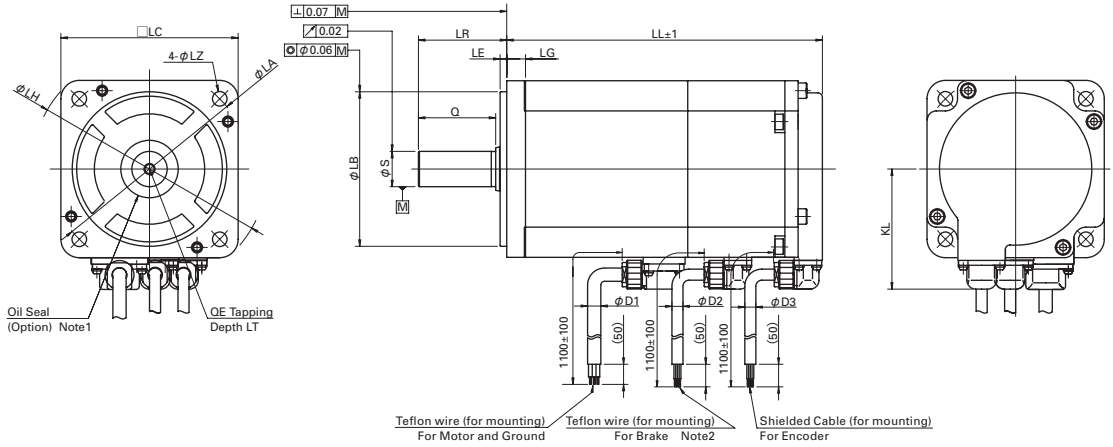
Note 10: Installation of a UL compliant and IEC / EN compliant earth leakage circuit braker is recommended.

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 one when using an absolute encoder.

Servo Motor Dimensions (Unit : mm)



*This is shown dimension for motor with brake

R2 motor High Efficiency and Low Ripple (Medium Inertia)

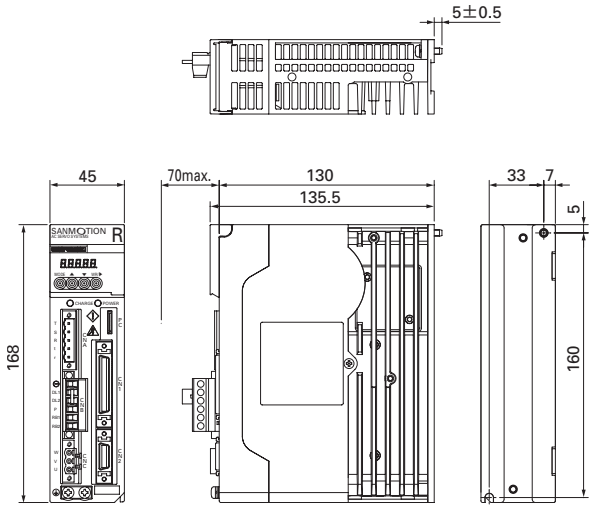
MODEL	Absolute Without Brake LL	Absolute With Brake LL	LG	KL	LA	LB	LE	LH	LC	LZ	LR	S	Q	QE	LT	Motor D1	Brake D2	Absolute D3	Oil Seal
R2AA04003△□◇	51.5	87.5	5	35.4	46	0 30-0.021	2.5	56	40	4.5	25	0 6-0.008	20	—	—	6	5	5	Note 1) None
R2AA04005△□◇	56.5	92.5										0 8-0.009							
R2AA04010△□◇	72	108																	
R2AA06010△□◇	58.5	82.5	6	44.6	70	0 50-0.025	3	82	60	5.5	25	0 8-0.009	20	—	—				
R2AA06020△□◇	69.5	97.5									30	0 14-0.011	25	M5	12				
R2AA06040△□◇	95.5	123.5																	
R2AA08075△□◇	107.3	143	8	54.4	90	0 70-0.030	3	108	80	6.6	40	0 16-0.011	35	M5	12				

Note 1) If an oil seal is needed , the ovearll motor length ill be slightly different.
Note 2) Brake connectors (cables) are not supplied for models without brakes.

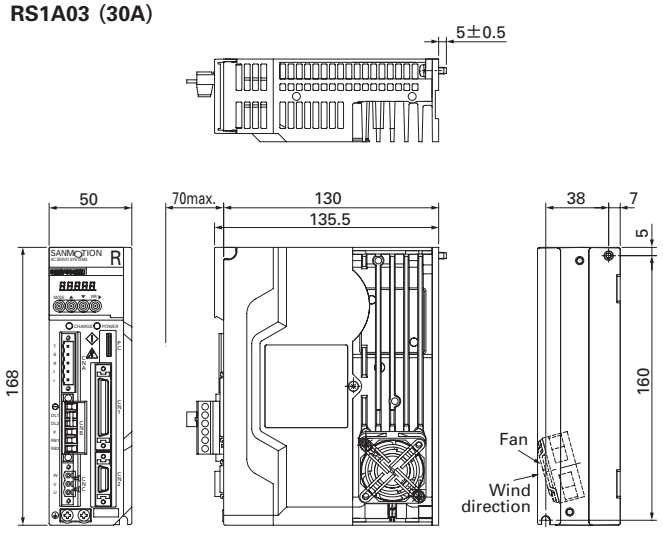
Servo Amplifier Dimensions (Unit : mm)

Single-Axis Specification

RS1A01 (15A)



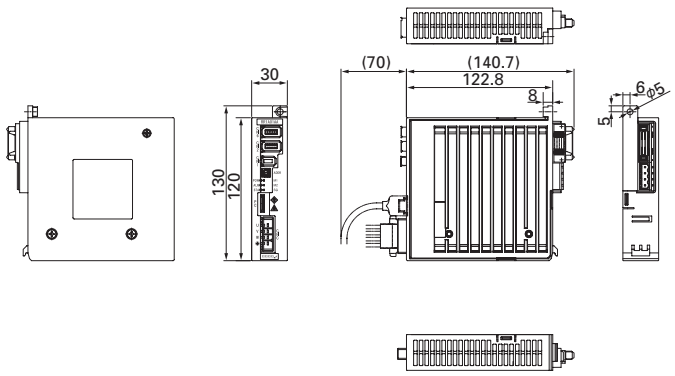
RS1A03 (30A)



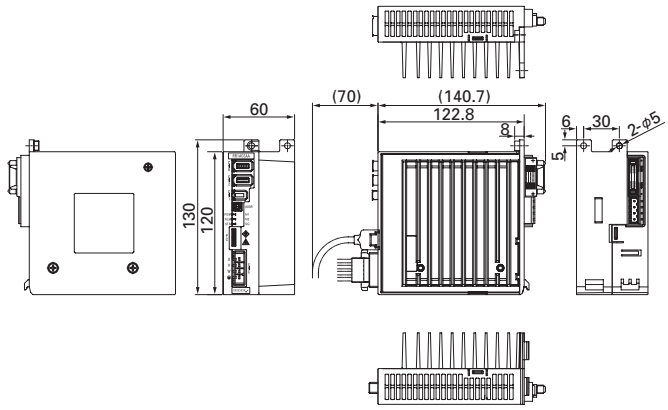
Multi-Axis Specification

Amplifier Unit

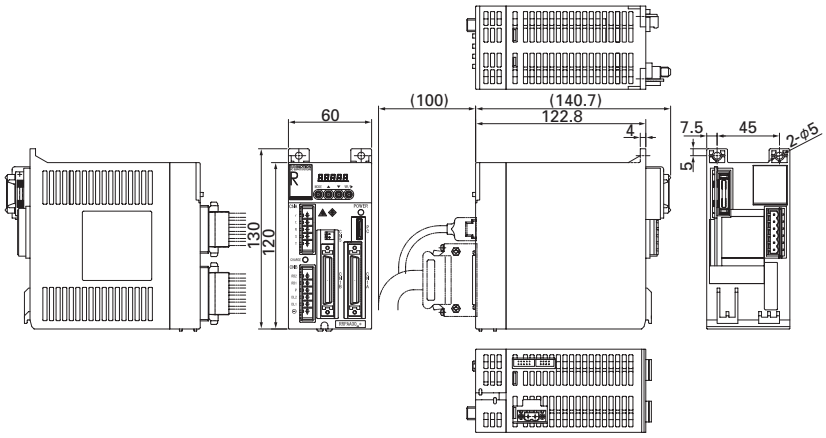
RR1A01 (15A)



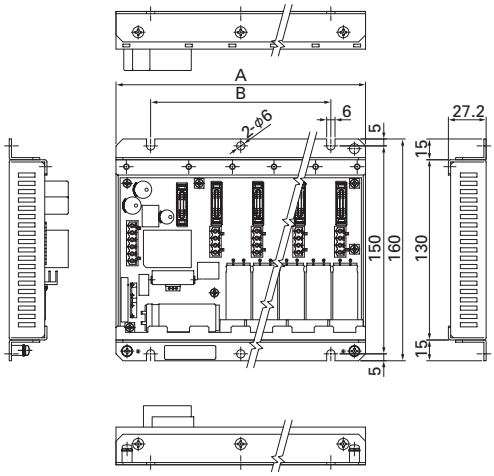
RR1A03 (30A)



Power Unit

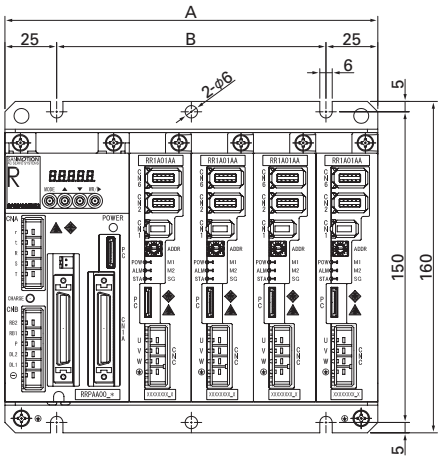


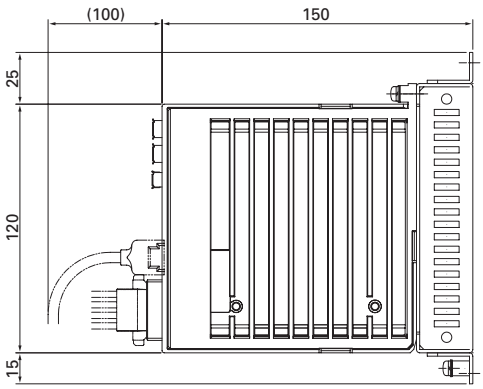
Motherboard



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

System Dimensions

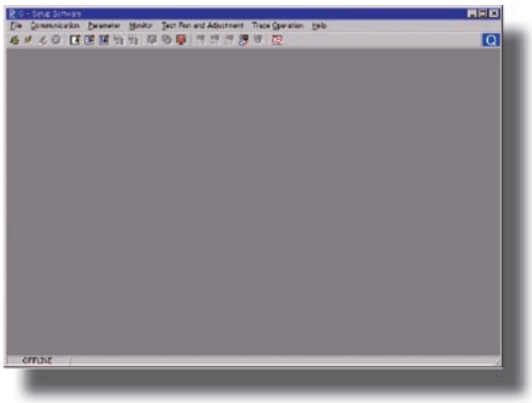




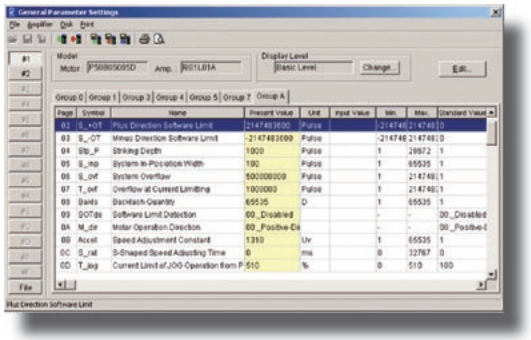
No.	Number of Slots	Supported size A	Supported size B
3	8	300	250
2	6	240	190
1	4	180	130

(1) Setup Software Start-up Screen

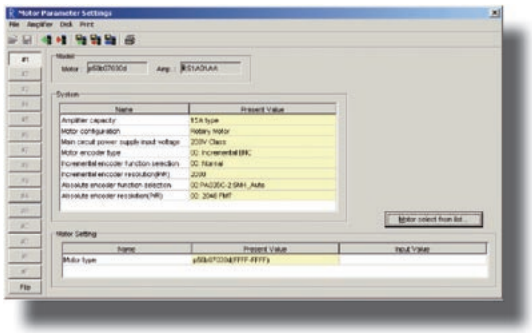
(2) Main Screen



(3) Parameter Configuration Screen

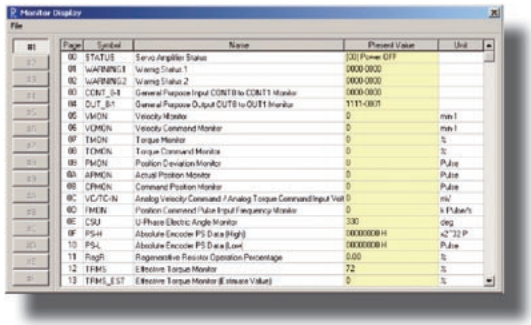


a. Configuration of General Parameters : Enables parameter loading, saving, etc., via PC connection

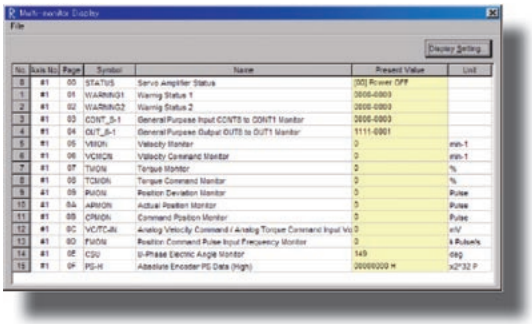


b. Configuration of Motor Parameters : Combined motors can be configured via PC connection

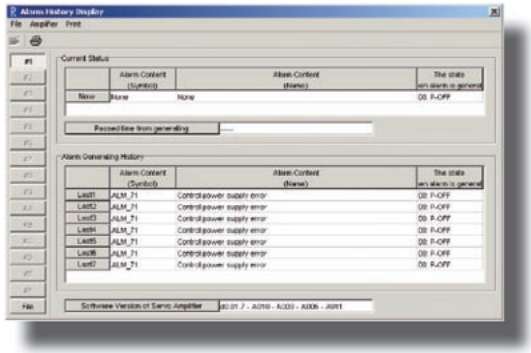
(4) Monitor Functions



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

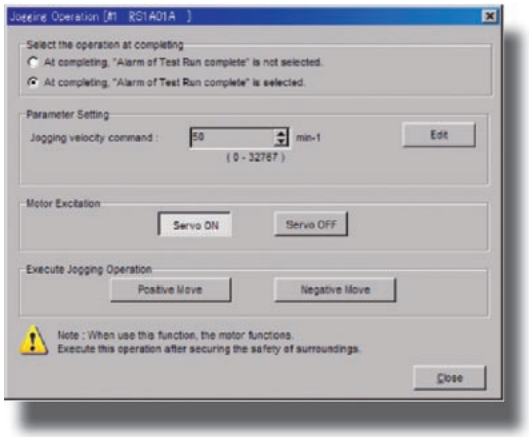


b. Multi-monitor Display : Simultaneous monitoring of operational status of multiple

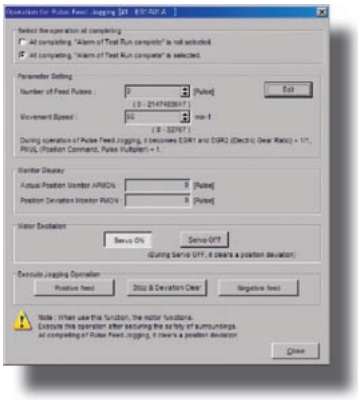


c. Alarm Record Display : Current and past alarm occurrence can be checked.

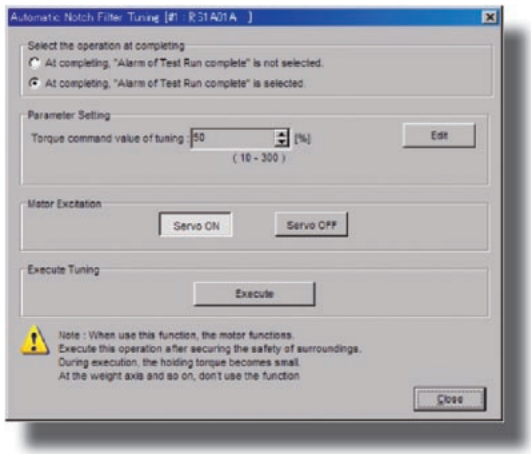
(5) Test Run and Adjustment Function



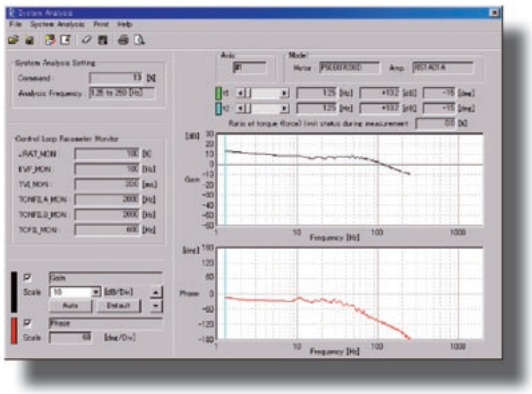
a. Speed Jog : Simplifies motor operation and the issuing of speed commands from a PC



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

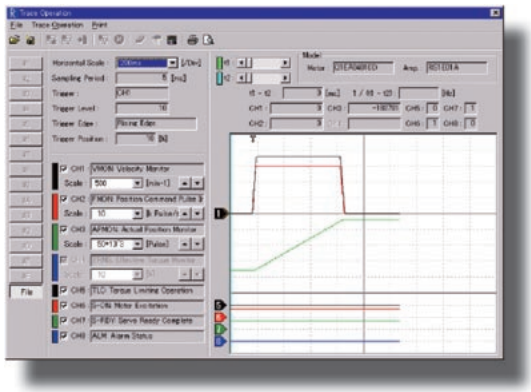


c. Auto Notch Filter Tuning : Configures the appropriate notch filter settings



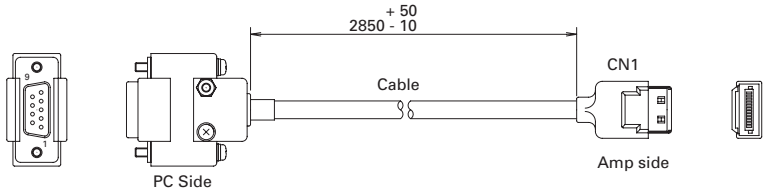
d. System Analysis : Analyzes servo system frequency characteristics

(6) Operation Trace Function



Graphically displays servo motor speed, current, and terminal status

PC Interface Cable [unit: mm]



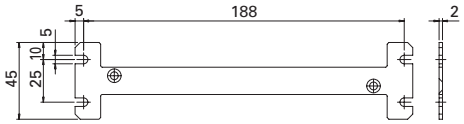
Model No.:AL-00490833-01

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

Mounting Hardware [unit: mm]

15A／30A

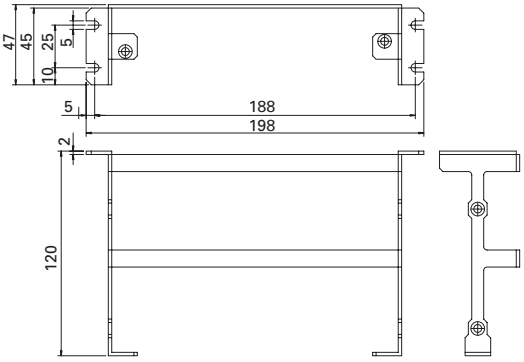
Rear Side



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

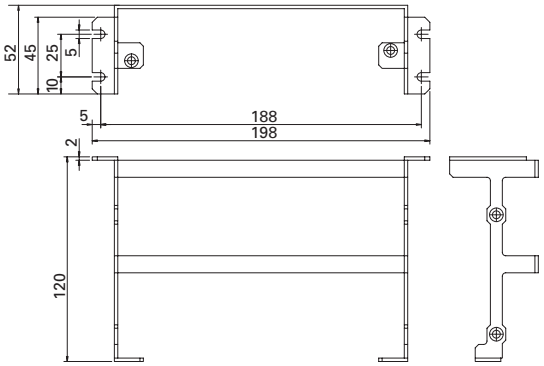
15A

Front Side



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

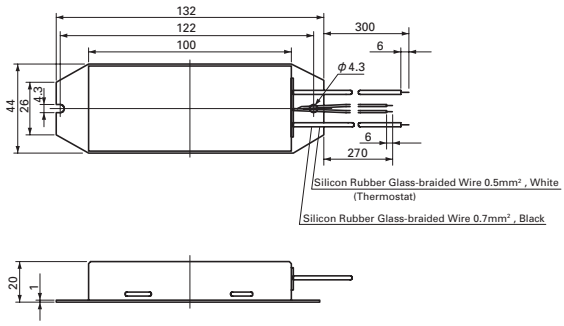
30A



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

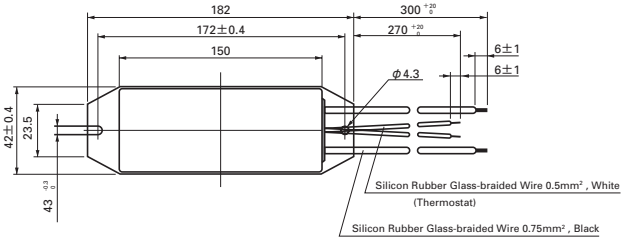
Model No.	AL-00582791-01	AL-00582788-01	AL-00582789-01
Contents	Mounting Bracket : 1 Screws : 2	Mounting Bracket : 1 Screws : 6	Mounting Bracket : 1 Screws : 6

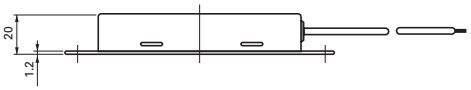
External Regenerative Resistor Dimensions [unit: mm]



Mass : 0.19kg

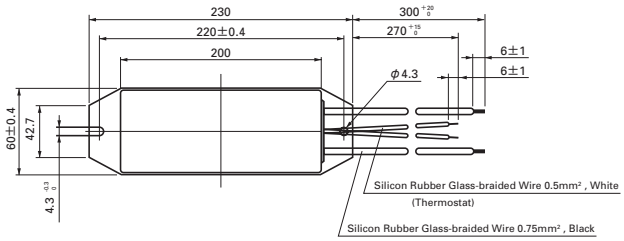
	Model No.	Thermostat
1	REGIST-080W100B	B-contact
2	REGIST-080W50B	B-contact

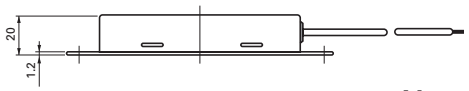




Mass : 0.24kg

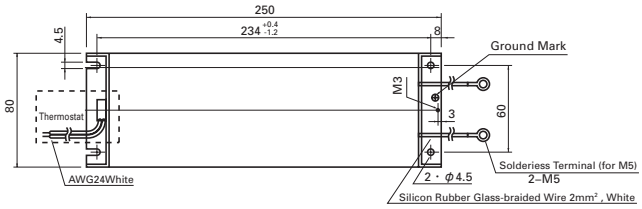
	Model No.	Remarks
1	REGIST-120W100B	Thermostat, B-contact
2	REGIST-120W50B	Thermostat, B-contact

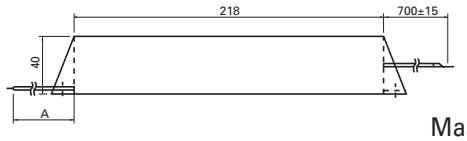




Mass : 0.44kg

	Model No.	Remarks
1	REGIST-220W20B	Thermostat, B-contact
2	REGIST-220W50B	Thermostat, B-contact
3	REGIST-220W100B	Thermostat, B-contact
4	REGIST-220W20B	Thermostat, B-contact





Mass : 1.4kg

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

Optional Equipment

Connectors for Single-Axis Amplifier Connections (AC200V Input Type)

Usage	Contents	Model No.	Manufacturer	Manufacturer's Part No.	Max. Amp. Capacity
Single Connectors	CN1 (Plug, Housing)	AL-00385594	Sumitomo 3M	10150-3000VE+10350-52A0-008	No Limit
	CN2 (Plug, Housing)	AL-00385596		10120-3000VE+10320-52A0-008	
	CNA (Plug)	AL-00329461-01	Phoenix Contact	MSTB2.5/5-STF-5.08	50A MAX.
	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	50A MAX.
	CN1,CN2 (Plug, Housing)	AL-00292309	Sumitomo 3M	10150-3000VE+10350-52A0-008	100A MIN.
				10120-3000VE+10320-52A0-008	

Connectors for Multi-Axis Amplifier Connections

	Contents		Model No.
Single Connectors	Amplifier Unit	CN1 (Plug, Housing)	AL-Y0003305-1
		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	AL-00385594
		CN1B	AL-00385594
Connector Sets	Amplifier Unit	CN1,CN2 (Plug, Housing) CN6,CNC (Plug)	AL-00632611
	Power Unit	CNA (Plug) CN1A,CN1B	AL-00632609

Inquiry Check Sheet

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

Company Name :

Depatrtment :

Telephone :

Fax :

1) Application :

2) Name of Machinery :

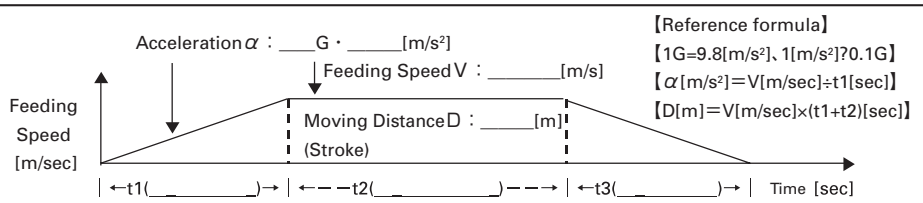
3) Number of Units :

Date :

To contact us :

Phone : +81 3 3917 5157

FAX : +81 3 3917 0643

	Item	Contents
❶	Name of target equipment	Equipment name, category (transport, processing, test, other)
❷	Name of servo axis	Axis name, axial mechanism (horizontal/vertical), brake mechanism (yes/no)
❸	Current condition of above axis	Manufacturer Name ( ) Series Name ( ) Motor Capacity ( ) Hydraulic, Mechanical, or New System ( )
❹	Positioning accuracy	± mm・± μm
❺	Operation pattern	
❻	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
❼	Mechanical structure	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・m²　JC (coupling inertia) kg・m² JN (nut inertia) kg・m²　JO (other motor-axis conversion inertia) kg・m² Db (ball-screw diameter) mm　Lb (ball-screw axial length) mm　Pb (ball -screw lead) mm Dp (pinion/pulley diameter) mm　Lp (pinion axial length) mm　tp (pully thickness) mm Dt (table diameter) mm　Dh (table-support dianeter) 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・cm³ μ (friction coefficient between sheet and shiliding-surface/support-section/roll)　ρ1 (specific gravity of roll-1 material) kg／cm³ ρ2 (specific gravity of roll-2 material) kg／cm³　κ (internal friction coefficient of preload nut) η (mechanical efficiency)　JL (load inertia of motor-axis conversion) kg・m² TF (friction torque of motor axis conversion) N・m　Tu (imbalance torque of motor axis conversion) N・m
❽	Speed reducer	Customer-provided (／)・*Sanyo standard(planet/spur/no-backlash-planet ／) other(／)
❾	Encoder type	Encoder type specified (yes / no) Yes: (incremental , optical absolute , optical absolute [resolver absolute with incremental function]) Resolution ( )
❿	Input format	Position , speed , torque , communications (SERCOS / CAN / DeviceNet) other ( )
⓫	Upper-level equipment (controller)	Sequencer , laptop , customer-developed product , Sanyo-provided , other ( )
⓬	Usage environment and other requirements	Cutting , clean-room use , anti-dust measures , other ( )
⓭	Estimated production	Single product: ( ) units/mouth ( ) units/year
⓮	Development cchedule	Prototype period: ( ) Year ( ) Month Production period: ( ) Year ( ) Month
⓯	Various measures	Related documentation (already submitted; send later by mail) Visit/PR desired (yes / no) Meeting desired (yes / no)
⓰	Miscellaneous (questions, pending problems, unresolved issues, etc.)	

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

■ ECO PRODUCTS

ECO PRODUCTS

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

■ Precautions For Adoption

⚠ Cautions

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 amplifiers 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

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