

# SANMOTION



## AC SERVO SYSTEMS

# R



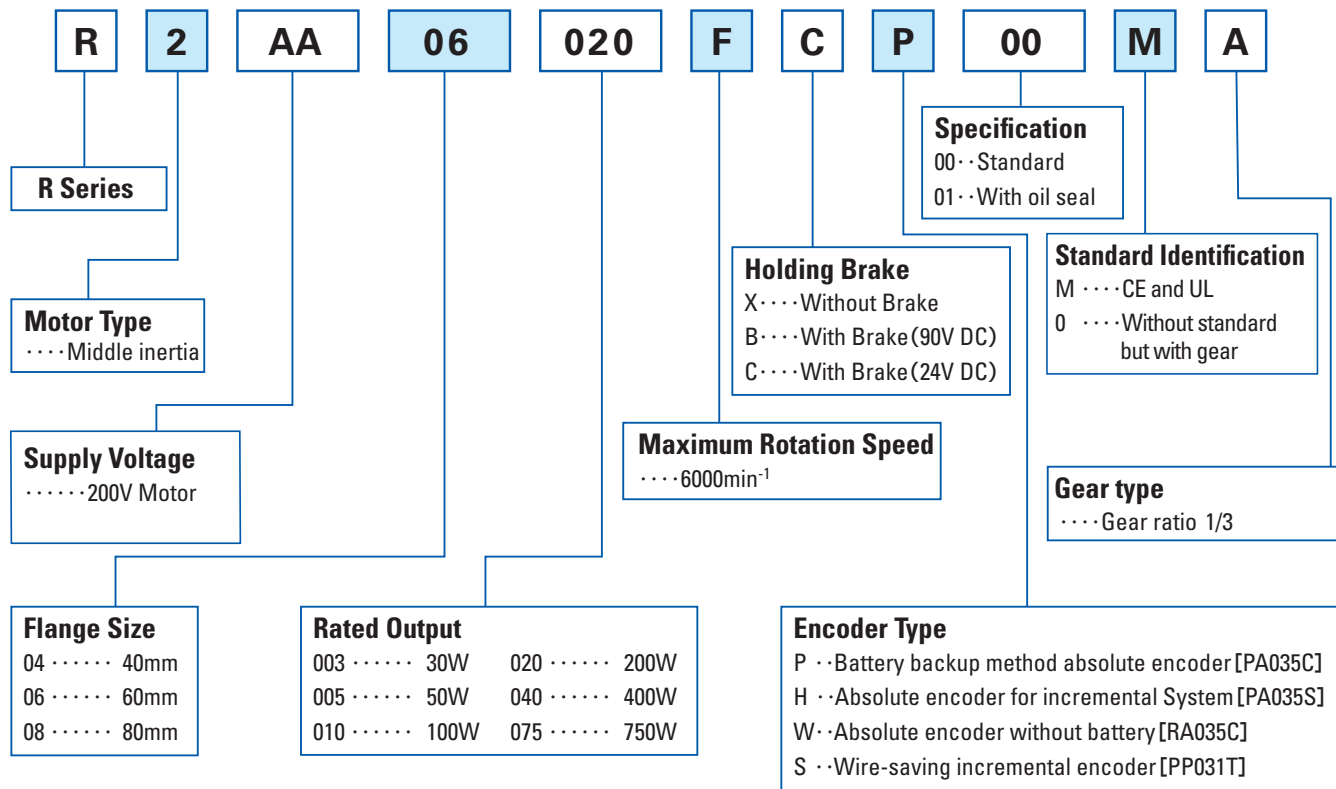
**SANYO DENKI**

**Ver.4**

## Servo Motor Model Number Nomenclature

### Servo Motor

Example: The following model number defines a "R2" servomotor with 60mm flange size, 200W rated output, 6000min<sup>-1</sup> 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 |
| RA035C | 131072(17bit)   | 65536(16bit)       | Absolute encoder without battery        |
| PP031T | 40000(10000P/R) | —                  | Wire-saving incremental encoder         |

### Conformance to Overseas Standards

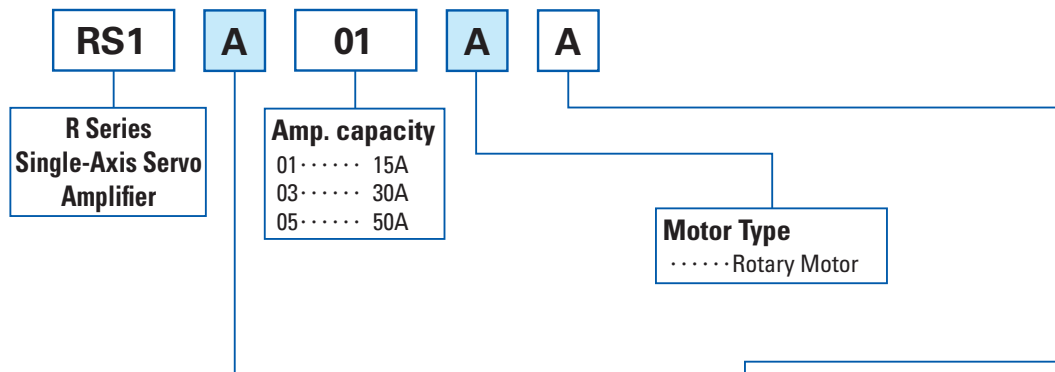
Our standard servo amplifier has attained the UL, c-UL and EN standards.

To comply with the EMC Directive, EMC filters can be used. You can also employ servo motors that have attained the UL and EN standards.



## Single-Axis Servo Amplifier (Analog/Pulse input type)

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



### Power Input, Internal Registration Setting

| Model | Input Voltage | Internal Registration Resistor | Amp. capacity            |
|-------|---------------|--------------------------------|--------------------------|
| L     | AC200V        | W                              | 15A,30A (option.setting) |
| A     |               | W/O                            | 15A,30A                  |
| A     |               | W                              | 50A                      |
| L     |               | W/O                            | 50A                      |
| N     | AC100V        | W                              | 15A,30A (option.setting) |
| E     |               | W/O                            | 15A,30A                  |

### Control Hardware Type

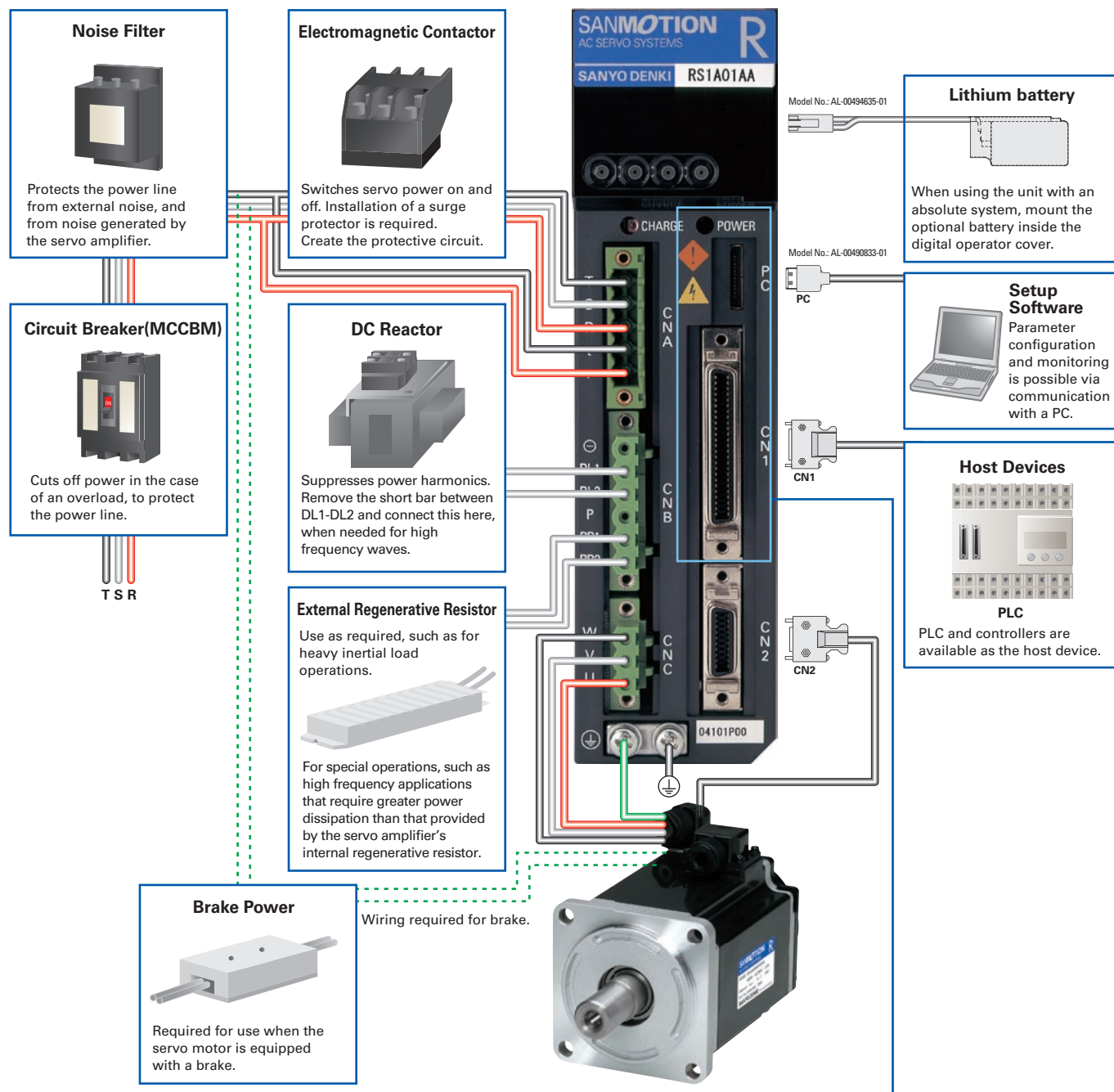
A... Encoder Specification : Absolute encoder  
Wire-saving incremental encoder  
Selectable output : NPN Output

B... Encoder Specification : Absolute encoder  
Wire-saving incremental encoder  
Selectable output : PNP Output

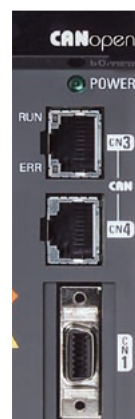
T... Full Closed-Loop

\*Please set the parameters for your selected motor accordingly before using.

## Single-Axis Servo Amplifier



## CANopen



### Host Devices



SANMOTION C

Dedicated controller PC and PLC are available as the host device.

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

## 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 Dwg's P20

★: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<br>《40》                                                                         | R2AA04005F<br>《40》 | R2AA04010F<br>《40》 |
|--------------------------------------------------|--------|------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------|--------------------|
|                                                  | Status | Symbol           | Unit                                                     |                                                                                            |                    |                    |
| Rated Output                                     | ★      | P <sub>R</sub>   | W                                                        | 30                                                                                         | 50                 | 100                |
| Rated Speed                                      | ★      | N <sub>R</sub>   | min <sup>-1</sup>                                        | 3000                                                                                       |                    |                    |
| Maximum Speed                                    | ★      | N <sub>max</sub> | min <sup>-1</sup>                                        | 6000                                                                                       |                    |                    |
| Rated Torque                                     | ★      | T <sub>R</sub>   | N·m                                                      | 0.098                                                                                      | 0.159              | 0.318              |
| Continuous Torque at Stall                       | ★      | T <sub>S</sub>   | N·m                                                      | 0.108                                                                                      | 0.167              | 0.318              |
| Peak Torque at Stall                             | ★      | T <sub>P</sub>   | N·m                                                      | 0.37                                                                                       | 0.59               | 1.18               |
| Rated Armature Current                           | ★      | I <sub>R</sub>   | Arms                                                     | 0.51                                                                                       | 0.67               | 0.81               |
| Armature Current at Stall                        | ★      | I <sub>S</sub>   | Arms                                                     | 0.56                                                                                       | 0.69               | 0.81               |
| Peak Armature Current at Stall                   | ★      | I <sub>P</sub>   | Arms                                                     | 2.15                                                                                       | 2.8                | 3.3                |
| Torque Constant                                  | ☆      | K <sub>T</sub>   | N·m／Arms                                                 | 0.201                                                                                      | 0.246              | 0.424              |
| Voltage Constant Per Phase                       | ☆      | K <sub>Eφ</sub>  | mV／min <sup>-1</sup>                                     | 7                                                                                          | 8.6                | 14.8               |
| Phase Resistance                                 | ☆      | R <sub>φ</sub>   | Ω                                                        | 12                                                                                         | 9                  | 9.3                |
| Rated Power Rate                                 | ★      | Q <sub>R</sub>   | kW／s                                                     | 3.9                                                                                        | 6.7                | 16                 |
| Electrical Time Constant                         | ☆      | t <sub>e</sub>   | ms                                                       | 0.55                                                                                       | 0.67               | 0.82               |
| Mechanical Time Constant (Not including Encoder) | ☆      | t <sub>m</sub>   | ms                                                       | 2.2                                                                                        | 1.7                | 0.97               |
| Rotor Moment of Inertia (Not including Encoder)  |        | J <sub>M</sub>   | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4) | 0.0247                                                                                     | 0.0376             | 0.0627             |
| Rotor Moment of Inertia (Encoder)                |        | J <sub>S</sub>   | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4) | 0.0033 (Note 3)                                                                            |                    |                    |
| Mass including Encoder                           |        | W <sub>E</sub>   | kg                                                       | 0.23                                                                                       | 0.27               | 0.39               |
| Brake Static Friction Torque                     |        | T <sub>B</sub>   | N·m                                                      | 0.32 MIN.                                                                                  |                    |                    |
| Brake Rated Voltage                              |        | V <sub>B</sub>   | V                                                        | DC90V／DC24V ± 10%                                                                          |                    |                    |
| Brake Rated Current                              |        | I <sub>B</sub>   | A                                                        | 0.07 ／ 0.27                                                                                |                    |                    |
| Rotor Moment of Inertia (Brake)                  |        | J <sub>B</sub>   | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /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)                     |        |                  |                                                          | RR1A01AAB00                                                                                |                    |                    |
| Amplifier Power Supply                           |        |                  |                                                          | AC200V to 230V +10, -15% 50/60Hz ± 3Hz (Note 2)                                            |                    |                    |
| Amp. Operating Temp. and RH                      |        |                  |                                                          | Operating Temperature: 0 to 55° C (Note1), Relative Humidity: 90% Maximum, no condensation |                    |                    |
| Power Consumption                                |        |                  | kVA                                                      | 0.2                                                                                        |                    | 0.4                |
| Amplifier Mass (Weight) [Single / CAN / Multi]   |        |                  | kg                                                       | 0.9 ／ 1.0 ／ 0.48                                                                           |                    |                    |

Note 1) 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.

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

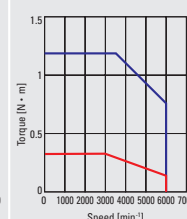
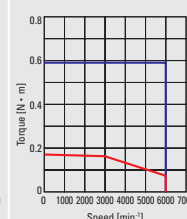
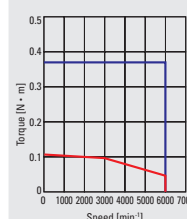
Note 3) This is an instance with the battery-backup method absolute encoder (PA035).

For the following encoders, please make inquiries:

·Absolute encoder without battery [ RA035C ]

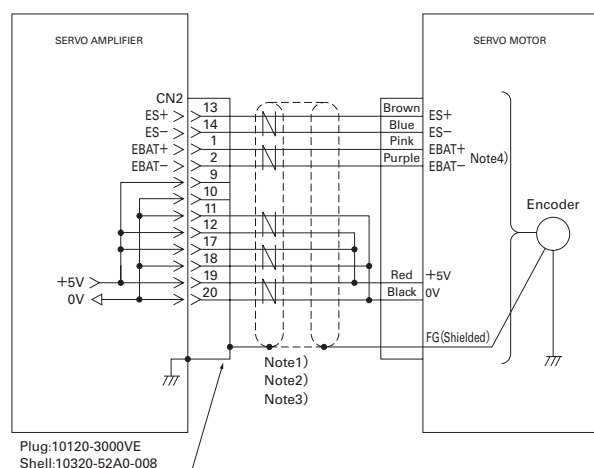
·Red. Wiring Incremental Encoder [ PP031T ]

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



## Encoder Wiring Diagram

### Single-Axis Servo Amplifier



Battery backup type absolute encoder [ PA035C ]

Absolute encoder for incremental system [ PA035S ]

Absolute encoder without battery [ RA035C ]

Note 1) Use a twisted-pair shielded cable.

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

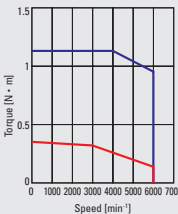
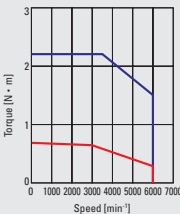
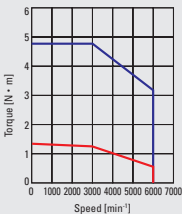
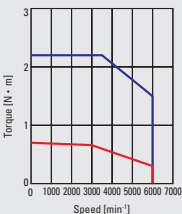
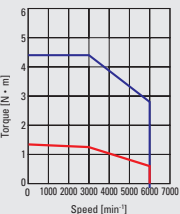
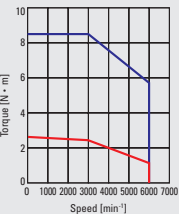
| Encoder cable length | 10m MAX.                                     | 25m MAX.                                     | 40m MAX.             |
|----------------------|----------------------------------------------|----------------------------------------------|----------------------|
| +5V DC Wiring 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

Note 3) Use a Awg24 0.2mm<sup>2</sup> encoder cable

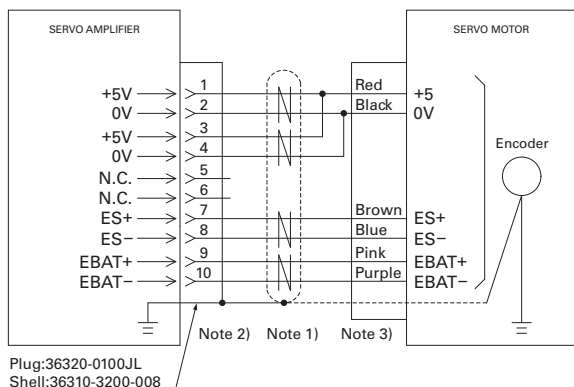
Note 4) When the Absolute encoder for incremental system or absolute encoder without battery is used, battery lines (EBAT+, EBAT-) are not required.

For the following encoders, please make inquiries:

·Red. Wiring incremental encoder [ PP031T ] Wiring diagram → page14

| R2AA06010F<br>《60》                                                                       | R2AA06020F<br>《60》                                                                  | R2AA06040F<br>《60》                                                                  | R2AA08020F<br>《80》                                                                  | R2AA08040F<br>《80》                                                                   | R2AA08075F<br>《80》                                                                    | Unit                                                     |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------|
| 100                                                                                      | 200                                                                                 | 400                                                                                 | 200                                                                                 | 400                                                                                  | 750                                                                                   | W                                                        |
| 3000                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |                                                                                       | min <sup>-1</sup>                                        |
| 6000                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |                                                                                       | min <sup>-1</sup>                                        |
| 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                                                                                 | 1.5                                                                                 | 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 <sup>-1</sup>                                   |
| 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 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4) |
| 0.0033 (Note 3)                                                                          |                                                                                     |                                                                                     |                                                                                     |                                                                                      |                                                                                       | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /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 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /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                                                                             |                                                                                       |                                                          |
| RR1A01AAB00                                                                              |                                                                                     | RR1A03AAB00                                                                         | RR1A01AAB00                                                                         | RR1A03AAB00                                                                          |                                                                                       |                                                          |
| AC200V to 230V +10, -15% 50/60Hz ± 3Hz (Note 2)                                          |                                                                                     |                                                                                     |                                                                                     |                                                                                      |                                                                                       |                                                          |
| Operating Temperature: 0 to 55°C (Note), Relative Humidity: 90% Maximum, no condensation |                                                                                     |                                                                                     |                                                                                     |                                                                                      |                                                                                       |                                                          |
| 0.4                                                                                      | 0.8                                                                                 | 1.0                                                                                 | 0.8                                                                                 | 1.0                                                                                  | 1.7                                                                                   | kVA                                                      |
| 0.9 / 1.0 / 0.48                                                                         |                                                                                     | 1.0 / 1.11 / 0.77                                                                   |                                                                                     | 1.0 / 1.11 / 0.77                                                                    |                                                                                       | kg                                                       |
|       |  |  |  |  |  |                                                          |

## Multi-Axis Servo Amplifier



## Battery backup type absolute encoder [ PA035C ]

- Note 1)  Use a twisted-pair shielded cable.
- Note 2) The sheathed shield wire should be connected to the metal case (ground) on CN2 side, before connecting to ground on encoder side.
- Note 3) Color symbols shown on the diagram for signal lines on encoder side refer to lead-wire type sensors.
- Note 4) The allowable connection distance between amplifier and encoder varies according to the diameter (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.

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

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

Setup Software

Optional Equipment

| R2AA13050D<br>《130mm sq.》 | R2AA13120D<br>《130mm sq.》 | R2AA13120B<br>《130mm sq.》 | R2AA13120L<br>《130mm sq.》 | Unit                                                     |
|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------------------------------------|
| 0.55                      | 1.2                       |                           |                           | kW                                                       |
| 2000                      | 2000                      |                           |                           | min <sup>-1</sup>                                        |
| 5000                      | 5000                      | 2000                      | 3000                      | min <sup>-1</sup>                                        |
| 2.6                       | 5.7                       |                           |                           | N·m                                                      |
| 23                        | 50                        |                           |                           | (lb·in)                                                  |
| 2.6                       | 6.0                       |                           |                           | N·m                                                      |
| 23                        | 53                        |                           |                           | (lb·in)                                                  |
| 7.0                       | 16                        |                           | 20                        | N·m                                                      |
| 62                        | 142                       |                           | 177                       | (lb·in)                                                  |
| 5.2                       | 9.1                       | 5.2                       | 7.6                       | Arms                                                     |
| 5.2                       | 9.3                       | 5.2                       | 8.4                       | Arms                                                     |
| 15.5                      | 25.4                      | 15.5                      | 26.5                      | Arms                                                     |
| 0.53                      | 0.65                      | 1.09                      | 0.77                      | N·m/Arms                                                 |
| 4.7                       | 5.8                       | 9.6                       | 6.8                       | (lb·in/Arms)                                             |
| 18.5                      | 22.7                      | 37.8                      | 27.0                      | mV/min <sup>-1</sup>                                     |
| 0.39                      | 0.23                      | 0.64                      | 0.35                      | Ω                                                        |
| 22                        | 54                        |                           |                           | kW/s                                                     |
| 14                        | 16                        |                           | 15                        | ms                                                       |
| 1.3                       | 0.98                      |                           | 1.1                       | ms                                                       |
| 3.1                       | 6.0                       |                           |                           | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4) |
| 11000                     | 21000                     |                           |                           | (lb·in <sup>2</sup> )                                    |
| 5                         | 7                         |                           |                           | kg                                                       |
| 3.5 MIN.                  | 9.0 MIN.                  |                           |                           | N·m                                                      |
| 24 / 90                   | 24 / 90                   |                           |                           | V                                                        |
| 0.41 / 0.15               | 0.51 / 0.17               |                           |                           | A                                                        |
| 0.5                       | 0.5                       |                           |                           | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4) |
| 1                         | 1                         |                           |                           | kg                                                       |

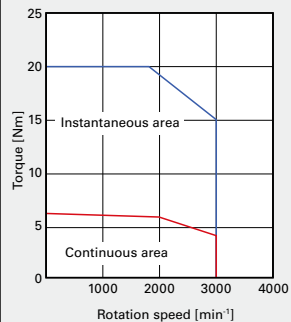
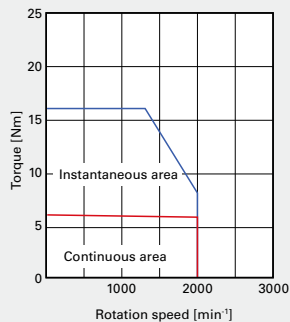
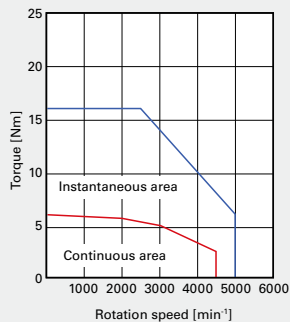
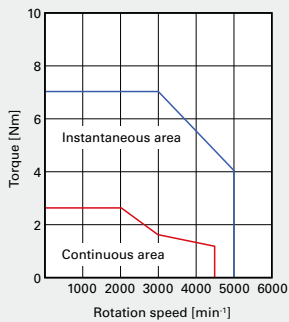
Temperature: 0 to 40°C, Humidity: Maximum 90% (no condensation)

|                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| RS1A03 / RS2A03 | RS1A05 / RS2A05 | RS1A03 / RS2A03 | RS1A05 / RS2A05 |
|-----------------|-----------------|-----------------|-----------------|

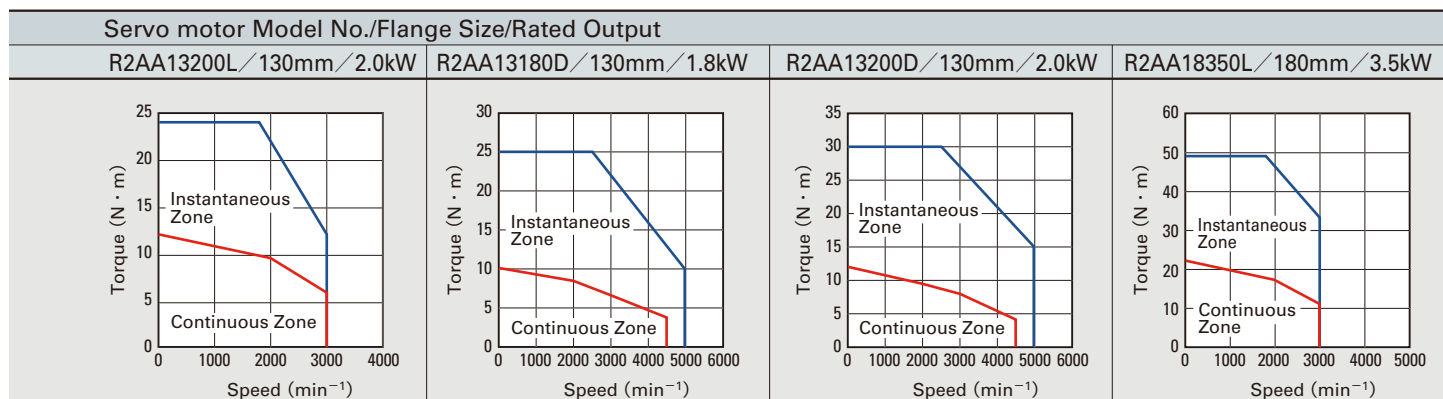
AC200V to 230V+10, - 15%, 50/60 ± 3Hz

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

|     |     |     |     |     |
|-----|-----|-----|-----|-----|
| 1.5 | 2.7 |     |     | kVA |
| 1.0 | 2.2 | 1.0 | 2.2 | kg  |

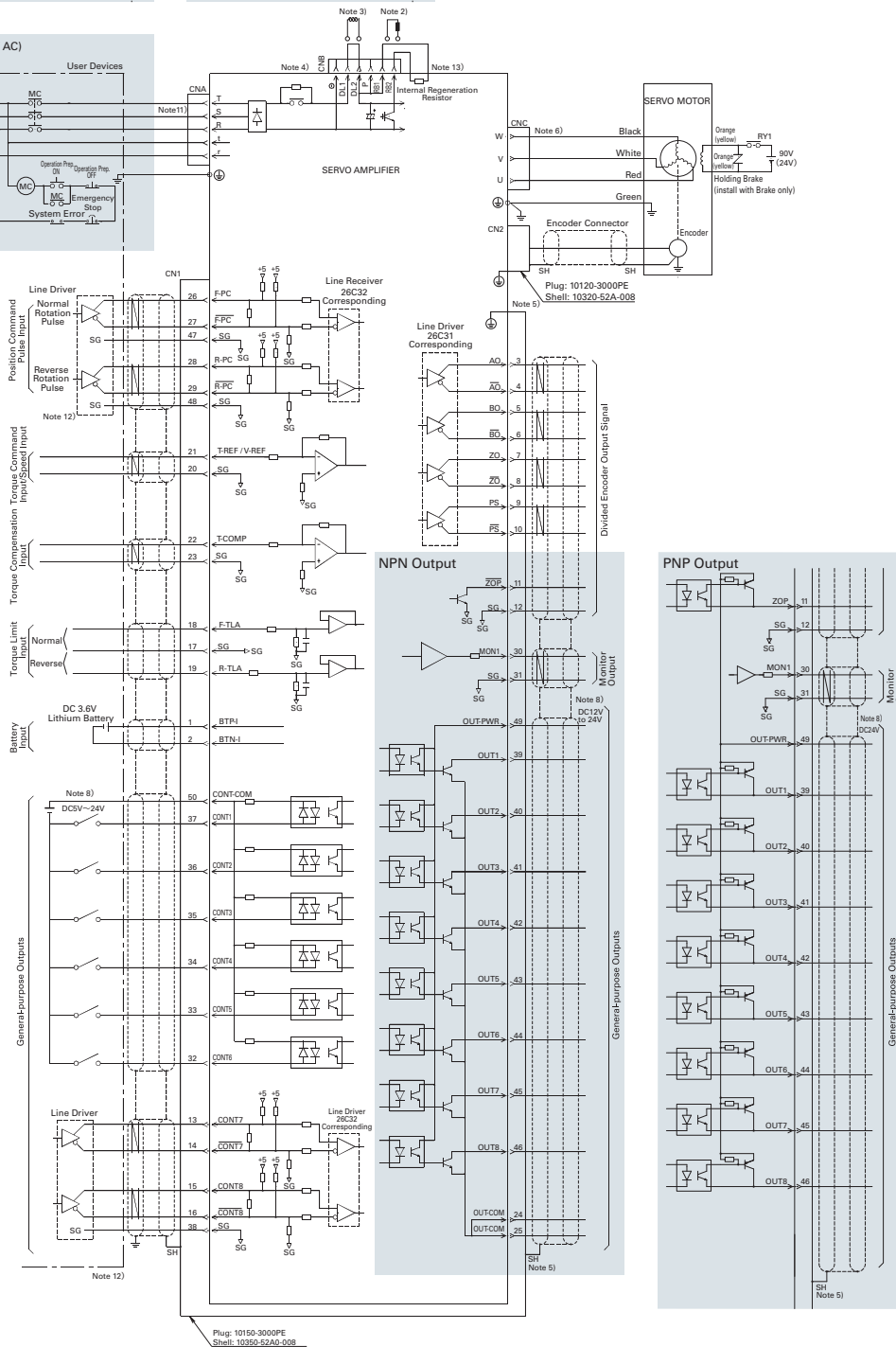
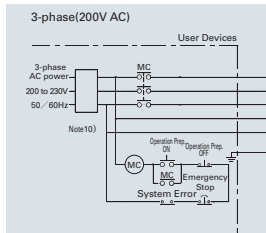
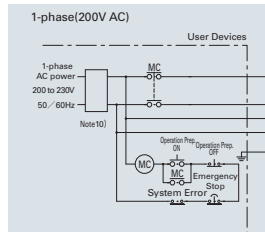
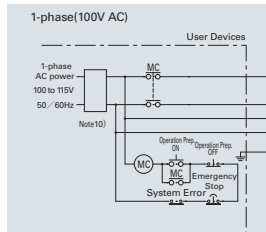


| RS2A05□□                                                                         |                           | RS2A10□□                  |                           | Servo Amplifier Model No.                                |                  |        |                                                               |
|----------------------------------------------------------------------------------|---------------------------|---------------------------|---------------------------|----------------------------------------------------------|------------------|--------|---------------------------------------------------------------|
| R2AA13200L<br>《130mm sq.》                                                        | R2AA13180D<br>《130mm sq.》 | R2AA13200D<br>《130mm sq.》 | R2AA18350L<br>《180mm sq.》 | Servo Motor Model No. and Flange Size                    |                  |        |                                                               |
|                                                                                  |                           |                           |                           | Unit                                                     | Symbol           | Status |                                                               |
| 2                                                                                | 1.8                       | 2                         | 3.5                       | kW                                                       | P <sub>R</sub>   | ★      | Rated Output                                                  |
| 2000                                                                             | 2000                      | 2000                      | 2000                      | min <sup>-1</sup>                                        | N <sub>R</sub>   | ★      | Rated Speed                                                   |
| 3000                                                                             | 5000                      | 5000                      | 3000                      | min <sup>-1</sup>                                        | N <sub>max</sub> | ★      | Maximum Speed                                                 |
| 9.5                                                                              | 8.6                       | 9.5                       | 17                        | N·m                                                      | T <sub>R</sub>   | ★      | Rated Torque                                                  |
| 12                                                                               | 10.0                      | 12                        | 22.0                      | N·m                                                      | T <sub>S</sub>   | ★      | Continuous Stall Torque                                       |
| 24                                                                               | 25                        | 30                        | 49                        | N·m                                                      | T <sub>P</sub>   | ★      | Peak Stall Torque                                             |
| 11.0                                                                             | 15.6                      | 14.3                      | 19.1                      | Arms                                                     | I <sub>R</sub>   | ★      | Rated Armature Current                                        |
| 12.0                                                                             | 17.3                      | 17.5                      | 23.7                      | Arms                                                     | I <sub>S</sub>   | ★      | Armature Stall Current                                        |
| 26.5                                                                             | 43.0                      | 45.5                      | 55.0                      | Arms                                                     | I <sub>P</sub>   | ★      | Peak Armature Stall Current                                   |
| 0.97                                                                             | 0.63                      | 0.70                      | 1.00                      | N·m/Arms                                                 | K <sub>T</sub>   | ☆      | Torque Constant                                               |
| 33.7                                                                             | 21.8                      | 24.3                      | 34.8                      | mV/min <sup>-1</sup>                                     | K <sub>Eφ</sub>  | ☆      | Voltage Constant for each Phase                               |
| 0.22                                                                             | 0.13                      | 0.11                      | 0.085                     | Ω                                                        | R <sub>φ</sub>   | ☆      | Phase Resistance                                              |
| 74                                                                               | 82                        | 74                        | 72                        | kW/s                                                     | Q <sub>R</sub>   | ★      | Rated Power Rate                                              |
| 17                                                                               | 16                        | 18                        | 18                        | ms                                                       | t <sub>e</sub>   | ☆      | Electrical Time Constant                                      |
| 0.86                                                                             | 0.89                      | 0.83                      | 1.0                       | ms                                                       | t <sub>m</sub>   | ☆      | Mechanical Time Constant<br>(Not including Encoder)           |
| 12.2                                                                             | 9.0                       | 12.2                      | 40                        | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4) | J <sub>M</sub>   |        | Roter Moment of Inertia ※ <sup>1</sup>                        |
| 0.0033 ※ <sup>1</sup>                                                            |                           |                           |                           | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4) | J <sub>s</sub>   |        | Roter Moment of Inertia (Encoder)                             |
| 10                                                                               | 7.7                       | 10                        | 15.5                      | kg                                                       | W <sub>E</sub>   |        | Servo Motor Mass ※ <sup>1</sup>                               |
| 12 MIN.                                                                          | 9.0 MIN.                  | 12 MIN.                   | 22 MIN.                   | N·m                                                      | T <sub>B</sub>   |        | Brake Static Friction Torque                                  |
| DC90V／DC24V ± 10%                                                                |                           |                           |                           | V                                                        | V <sub>B</sub>   |        | Brake Rated Voltage                                           |
| 0.17／0.66                                                                        | 0.17／0.51                 | 0.17／0.66                 | 0.32／1.2                  | A                                                        | I <sub>B</sub>   |        | Brake Rated Current                                           |
| 0.5                                                                              | 0.5                       | 0.5                       | 5.1                       | ×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4) | J <sub>B</sub>   |        | Roter Moment of Inertia (Brake)                               |
| 1.5                                                                              | 1.5                       | 1.5                       | 2.4                       | kg                                                       | W                |        | Brake Mass                                                    |
| Operating Temperature: 0 to 40℃, Relative Humidity: 90% maximum, no condensation |                           |                           |                           |                                                          |                  |        | Servo Motor Operating Temp, Rel.Humidity                      |
| 5.0                                                                              | 4.0                       | 5.0                       | 6.0                       | kVA                                                      |                  |        | Servo amplifier power supply capacity (rating)                |
| Yes                                                                              | Yes                       | Yes                       |                           |                                                          |                  |        | CE and UL approved servo motors ※ <sup>5</sup>                |
| IP65                                                                             |                           |                           |                           |                                                          |                  |        | Servo motor protection code                                   |
| t20×470mm sq.                                                                    |                           |                           |                           |                                                          |                  |        | Size of aluminum plates for heat radiation during measurement |





## Single-Axis Servo Amplifier



Note 1) For the parts marked with a shield symbol, use a shielded cable.

Note 2) Connect a regenerative resistor between terminals RB1 - RB2. When using an external regenerative resistor, first remove the internal regenerative resistor wiring between terminals RB1 and RB2, and then connect an external regenerative resistor between terminals RB1 - RB2.

Note 3) 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  $\ominus$  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.

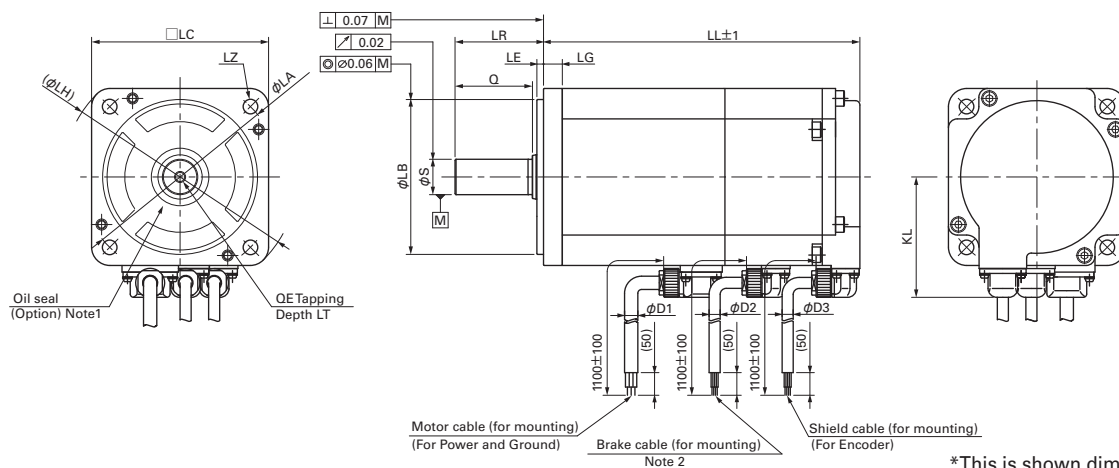
Note 9) R, S, T, r, t,  $\odot$ , P, DL2, RB1, RB2, U, V, W are high-voltage circuits; all other signal lines are low-voltage circuits. When wiring, maintain sufficient distance between high-voltage and low-voltage circuits.

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.

## Servo Motor Dimensions (Unit : mm)



\*This is shown dimension for motor with brake

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

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

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

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.

For the following encoders, please make inquiries:

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

Features and Functions

Model Number Nomenclature

System Configuration

Standard Specifications

External Wiring Diagram

Dimensions

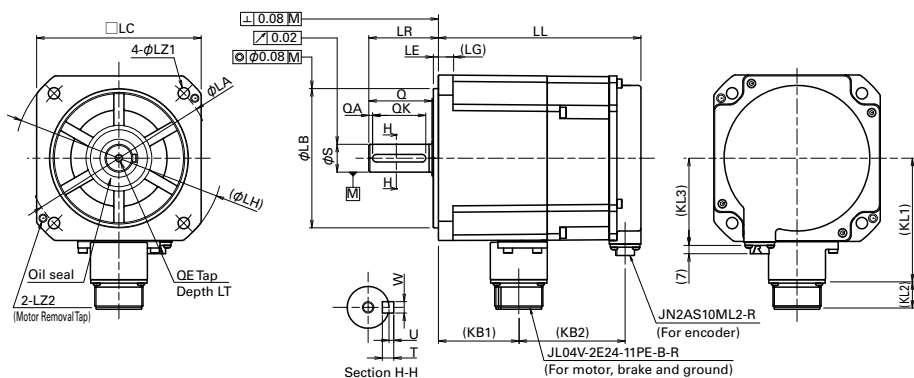
Setup Software

Optional Equipment

## 130mm sq.

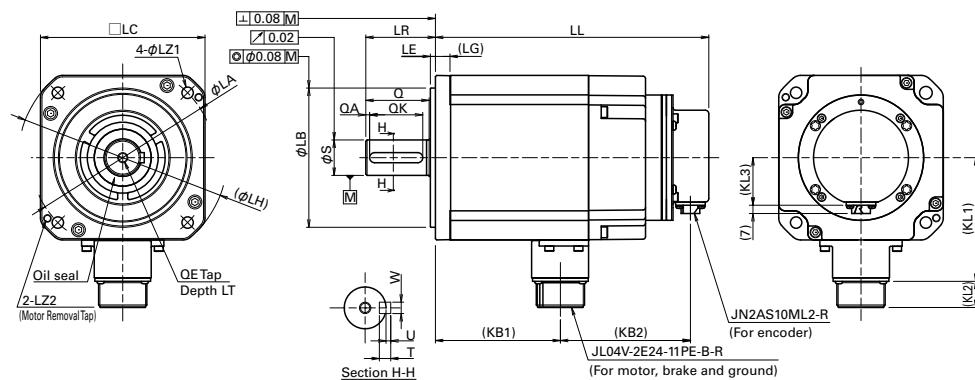
Model No. : R2AA13050

R2AA13120



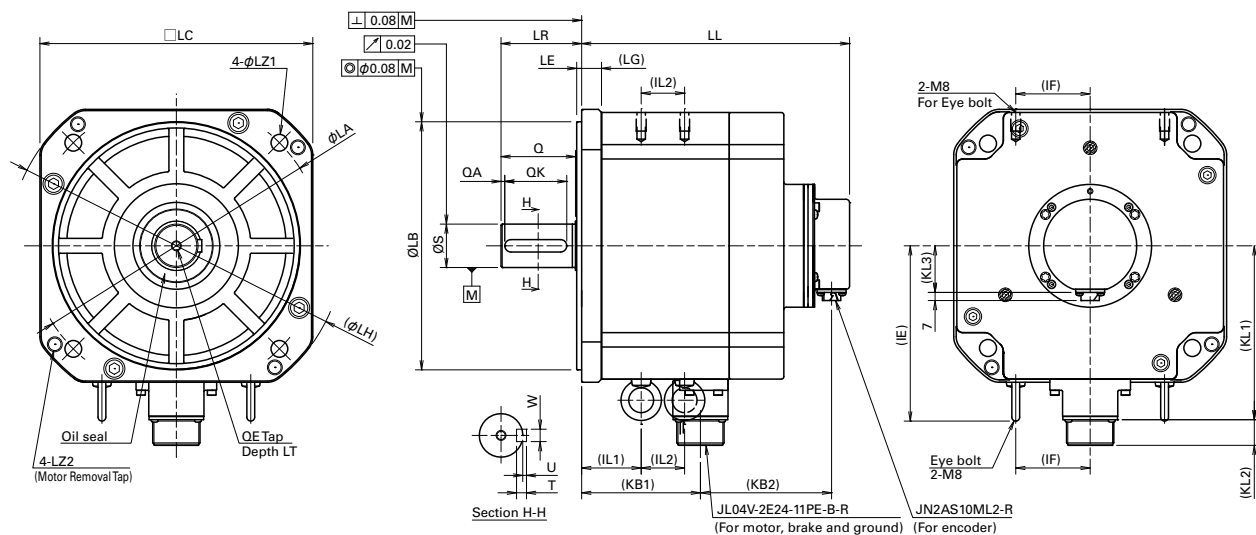
## 130mm sq.

Model No. : R2AA13200



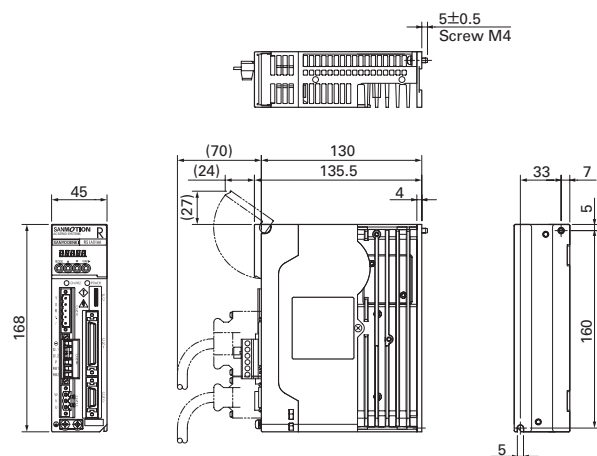
## 220mm sq.

Model No. : R2AA22500

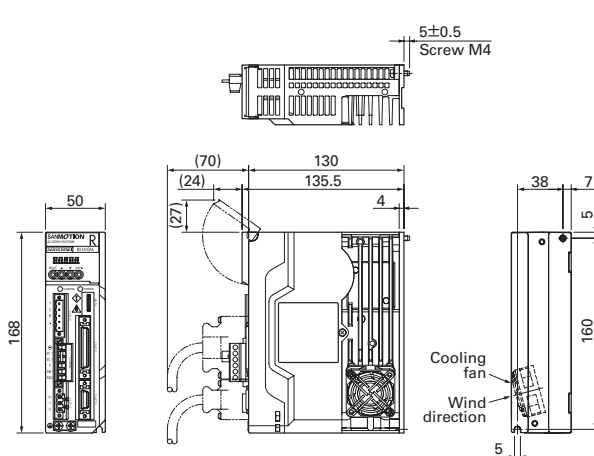


## Single-Axis Servo Amplifier (Analog/Pulse input type , Built-in positioning function model)

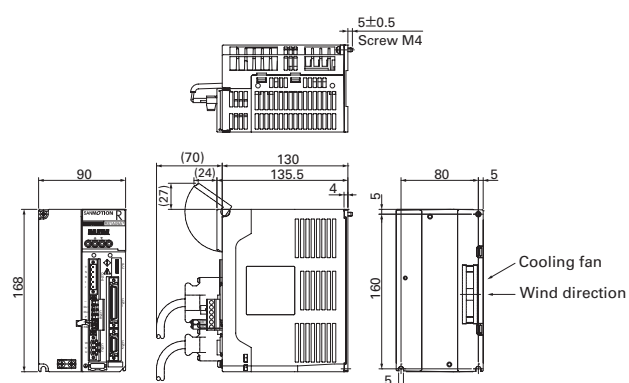
RS1 □ 01A □ (15A)



RS1 □ 03A □ (30A)

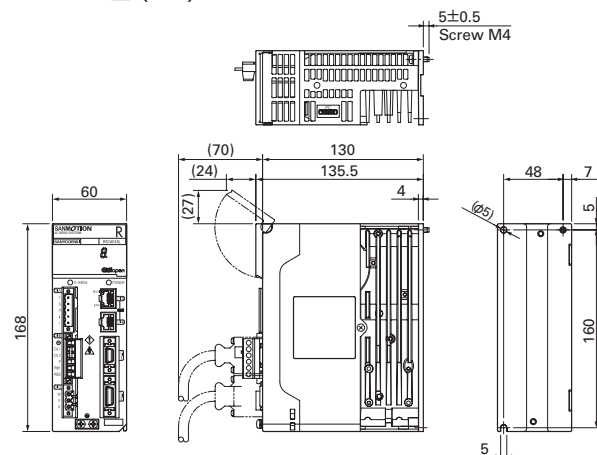


RS1 □ 05A □ (50A)



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

RS1A01A □ (15A)



RS1A03A □ (30A)

