

# SANMOTION R

## AC SERVO SYSTEMS

High Performance AC Servo motor



### 200V System

**130mm sq.**  
**0.55kW to 2kW**

**220mm sq.**  
**5kW**

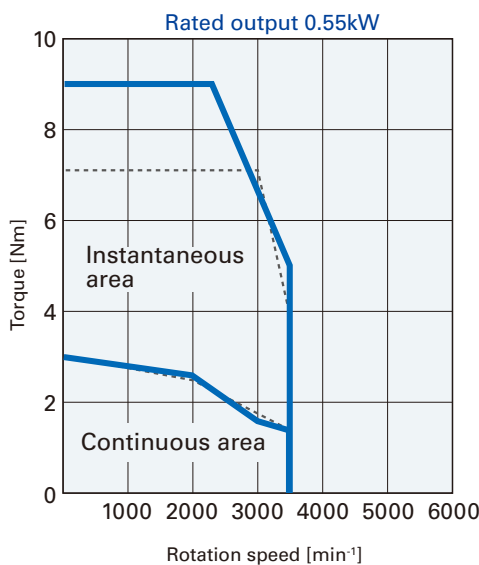
### Low cogging torque

The motor achieved low cogging torque and 0.5% max. comparison of rated torque. It is suitable for vibration sensitive applications and improves precision of equipment.

### High torque

26% increased maximum instantaneous torque, compared with our conventional products. (Rated output 0.55kW motor)

■ Torque and rotation speed characteristics — New products    - - - - Our conventional products

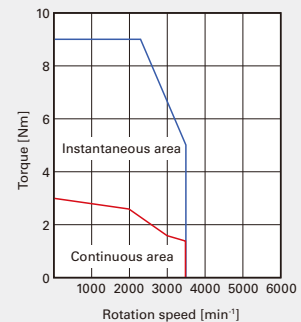


## Standard Specifications

Motor model No. and square flange dimension in 《 》				R2AA13050H 《130mm sq.》
	Condition	Symbol	Unit	
Rated Output	★	P <sub>R</sub>	kW	0.55
Rated Speed	★	N <sub>R</sub>	min <sup>-1</sup>	2000
Maximum Speed	★	N <sub>max</sub>	min <sup>-1</sup>	3500
Rated Torque	★	T <sub>R</sub>	N·m	2.6
			(lb·in)	23
Continuous Torque at Stall	★	T <sub>S</sub>	N·m	3.0
			(lb·in)	27
Peak Torque at Stall	★	T <sub>P</sub>	N·m	9.0
			(lb·in)	80
Rated Armature Current	★	I <sub>R</sub>	Arms	4.2
Armature Current at Stall	★	I <sub>S</sub>	Arms	4.6
Peak Armature Current at Stall	★	I <sub>P</sub>	Arms	15.5
Torque Constant	☆	K <sub>T</sub>	N·m/Arms	0.67
			(lb·in/Arms)	5.9
Voltage Constant Per Phase	☆	K <sub>Eφ</sub>	mV/min <sup>-1</sup>	23.5
Phase Resistance	☆	R <sub>φ</sub>	Ω	0.65
Rated Power Rate	★	Q <sub>R</sub>	kW/s	22
Electrical Time Constant	☆	t <sub>e</sub>	ms	14
Mechanical Time Constant (including Encoder)	☆	t <sub>m</sub>	ms	1.3
Rotor Moment of Inertia (including Encoder)		J <sub>m</sub>	× 10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4)	3.1
			(lb·in <sup>2</sup> )	11000
Motor Mass (including Encoder)		W <sub>E</sub>	kg	5
Brake Static Friction Torque		T <sub>B</sub>	N·m	3.5 MIN.
Brake Rated Voltage		V <sub>B</sub>	V	24 / 90
Brake Rated Current		I <sub>B</sub>	A	0.41 / 0.15
Brake Inertia		J <sub>B</sub>	× 10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4)	0.5
Brake Mass		W	kg	1
Motor Operating Temp, Rel. Humidity				Temperature: 0 to 40°C, Humidity: Maximum 90% (no condensation)
Applicable Amplifier Model No.				RS1A03 / RS2A03
Servo Amplifier Input Power				AC200V to 230V+10, - 15%, 50/60 ± 3Hz
Amp. Operating Temp. and RH				Temperature: 0 to 55°C, Humidity: Maximum 90% (no condensation)
Power Capacity (Rated)			kVA	1.5
Amplifier Mass			kg	1.0

★ mark indicates a typical value after temperature increased and saturated in the combination with the standard amplifier.

☆ mark indicates a typical value when the winding temperature is at 20°C.



R2AA13050D 《130mm sq.》	R2AA13120D 《130mm sq.》	R2AA13120B 《130mm sq.》	R2AA13120L 《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

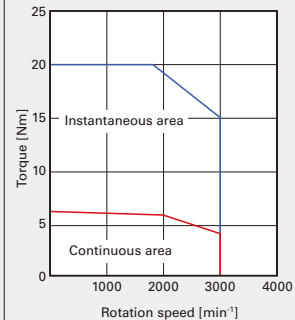
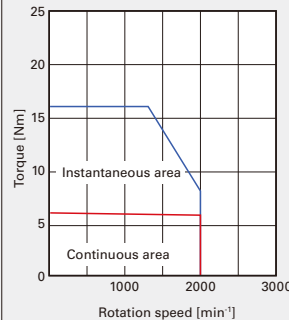
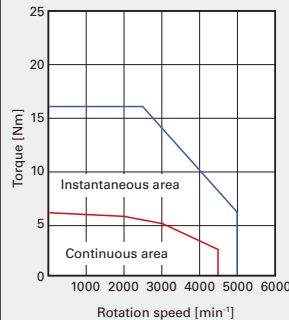
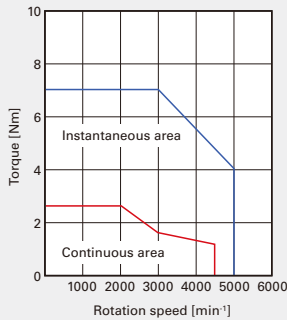
1.0

2.2

1.0

2.2

kg



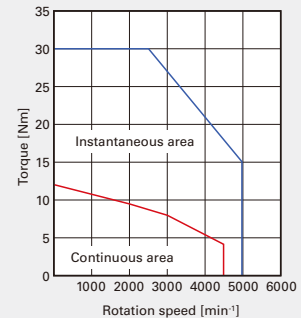
## Standard Specifications

Motor model No. and square flange dimension in 《 》	R2AA13200D 《130mm sq.》			
	Condition	Symbol	Unit	
Rated Output	★	P <sub>R</sub>	kW	2
Rated Speed	★	N <sub>R</sub>	min <sup>-1</sup>	2000
Maximum Speed	★	N <sub>max</sub>	min <sup>-1</sup>	5000
Rated Torque	★	T <sub>R</sub>	N·m	9.5
			(lb·in)	84
Continuous Torque at Stall	★	T <sub>S</sub>	N·m	12
			(lb·in)	106
Peak Torque at Stall	★	T <sub>P</sub>	N·m	30
			(lb·in)	265
Rated Armature Current	★	I <sub>R</sub>	Arms	14.3
Armature Current at Stall	★	I <sub>S</sub>	Arms	17.5
Peak Armature Current at Stall	★	I <sub>P</sub>	Arms	45.5
Torque Constant	☆	K <sub>T</sub>	N·m/Arms	0.70
			(lb·in/Arms)	6.2
Voltage Constant Per Phase	☆	K <sub>Eφ</sub>	mV/min <sup>-1</sup>	24.3
Phase Resistance	☆	R <sub>φ</sub>	Ω	0.11
Rated Power Rate	★	Q <sub>R</sub>	kW/s	74
Electrical Time Constant	☆	t <sub>e</sub>	ms	18
Mechanical Time Constant (including Encoder)	☆	t <sub>m</sub>	ms	0.83
Rotor Moment of Inertia (including Encoder)		J <sub>m</sub>	× 10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4)	12.2
			(lb·in <sup>2</sup> )	42000
Motor Mass (including Encoder)		W <sub>E</sub>	kg	10
Brake Static Friction Torque		T <sub>B</sub>	N·m	12 MIN.
Brake Rated Voltage		V <sub>B</sub>	V	24 / 90
Brake Rated Current		I <sub>B</sub>	A	0.66 / 0.17
Brake Inertia		J <sub>B</sub>	× 10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4)	0.5
Brake Mass		W	kg	1.5
Motor Operating Temp, Rel. Humidity				Temperature: 0 to 40°C, Humidity: Maximum 90% (no condensation)
Applicable Amplifier Model No.				RS1A10
Servo Amplifier Input Power				AC200V to 230V+10, - 15%, 50/60 ± 3Hz
Amp. Operating Temp. and RH				Temperature: 0 to 55°C, Humidity: Maximum 90% (no condensation)
Power Capacity (Rated)			kVA	5.0
Amplifier Mass			kg	5.5

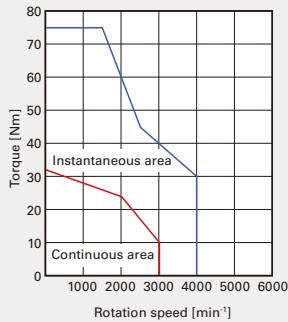
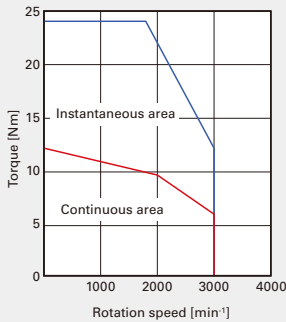
★ mark indicates a typical value after temperature increased and saturated in the combination with the standard amplifier.

☆ mark indicates a typical value when the winding temperature is at 20°C.

Please use the average rotational speed of the motor below the maximum rotational speed of the continuous zone.



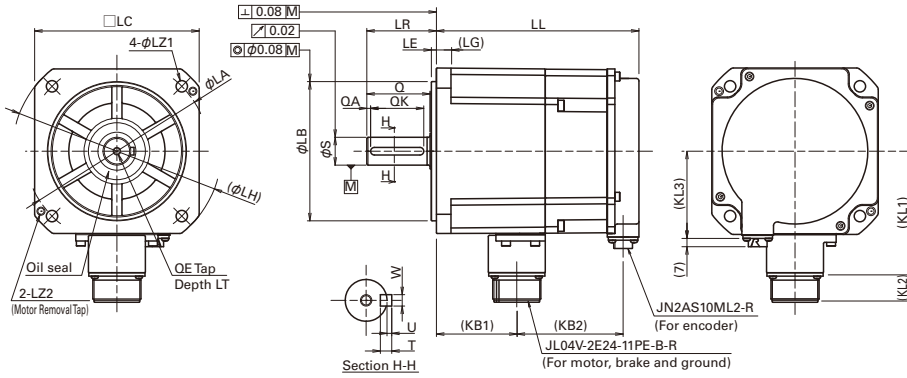
R2AA13200L 《130mm sq.》	R2AA22500L 《220mm sq.》	Unit
2	5	kW
2000	2000	min <sup>-1</sup>
3000	4000	min <sup>-1</sup>
9.5	24	N·m
84	212	(lb·in)
12	32	N·m
106	283	(lb·in)
24	75	N·m
212	664	(lb·in)
11.0	22.0	Arms
12.0	34	Arms
26.5	83	Arms
0.97	1.00	N·m/Arms
8.6	8.8	(lb·in/Arms)
33.7	34.9	mV/min <sup>-1</sup>
0.22	0.047	Ω
74	105	kW/s
17	40	ms
0.86	0.78	ms
12.2	55	×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4)
42000	188000	(lb·in <sup>2</sup> )
10	24	kg
12 MIN.	42 MIN.	N·m
24 / 90	24 / 90	V
0.66 / 0.17	1.2 / 0.32	A
0.5	5.1	×10 <sup>-4</sup> kg·m <sup>2</sup> (GD <sup>2</sup> /4)
1.5	4	kg
Temperature: 0 to 40°C, Humidity: Maximum 90% (no condensation)		
RS1A05 / RS2A05	RS1A15	
AC200V ~ 230V+10, - 15%, 50/60 ± 3Hz		
Temperature: 0 to 55°C, Humidity: Maximum 90% (no condensation)		
5.0	9.6	kVA
2.2	6.5	kg



Please use the average rotational speed of the motor below the maximum rotational speed of the continuous zone.

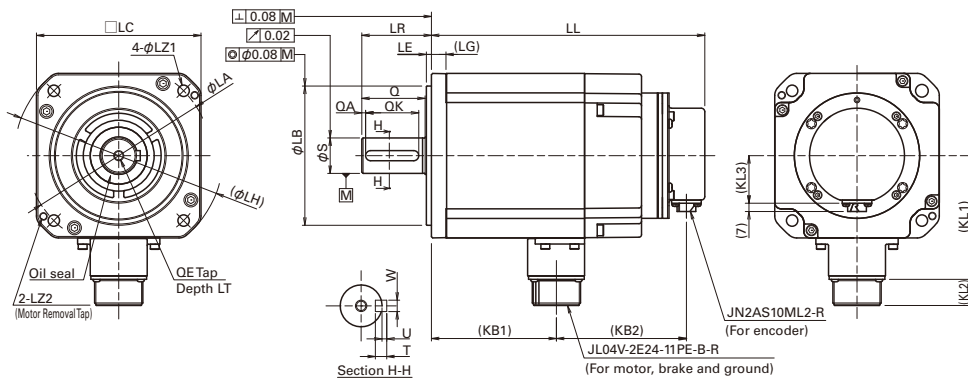
130mm sq.

Model No. : R2AA13050  
R2AA13120



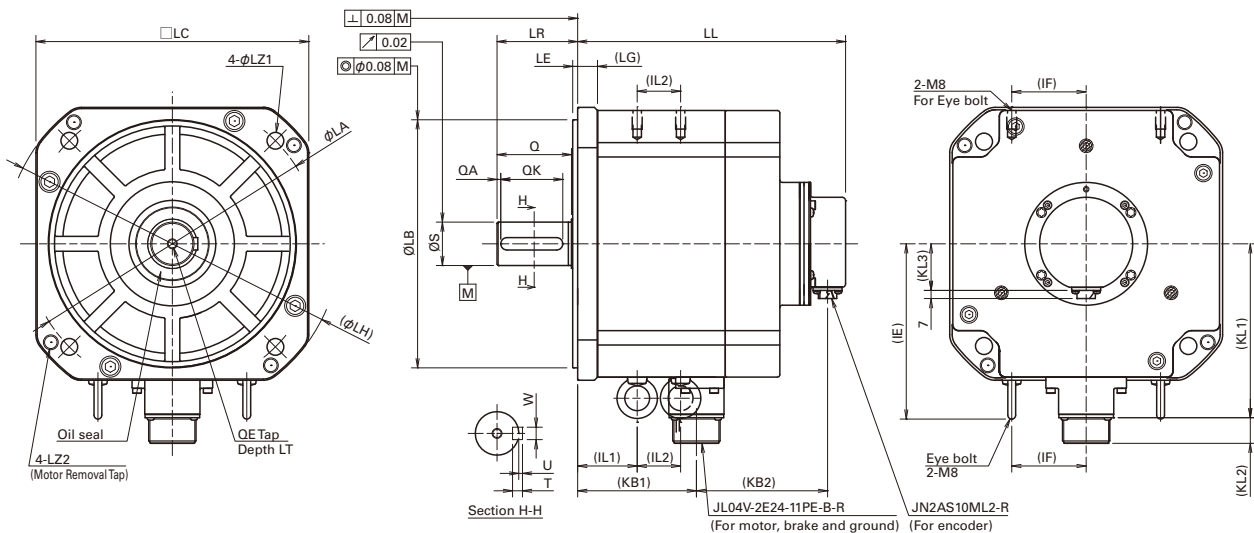
130mm sq.

Model No. : R2AA13200



220mm sq.

Model No. : R2AA22500



※ All sizes are motors with battery backup method absolute encoder.

MODEL	Without Brake		With Brake		LG	KL1	KL2	KL3	LA	LB	LE	LH	LC
	LL	KB2	LL	KB2									
R2AA13050□□□□	103	44	139.5	81	12	98	21	69	145	110 <sup>0</sup> <sub>-0.035</sub>	4	165	130
R2AA13120□□□□	120.5		160	84									

LZ1	LZ2	LR	S	Q	QA	QK	W	T	U	KB1	QE	LT
9	M6	55	22 <sup>0</sup> <sub>-0.013</sub>	50	3	42	6 <sup>0</sup> <sub>-0.030</sub>	6	2.5	46 64	M6	20

MODEL	Without Brake		With Brake		LG	KL1	KL2	KL3	LA	LB	LE	LH	LC
	LL	KB2	LL	KB2									
R2AA13200□□□□	171	57	216	103	12	98	21	38	145	110 <sup>0</sup> <sub>-0.035</sub>	4	165	130

LZ1	LZ2	LR	S	Q	QA	QK	W	T	U	KB1	QE	LT
9	M6	55	28 <sup>0</sup> <sub>-0.013</sub>	50	3	42	8 <sup>0</sup> <sub>-0.036</sub>	7	3	99	M8	25

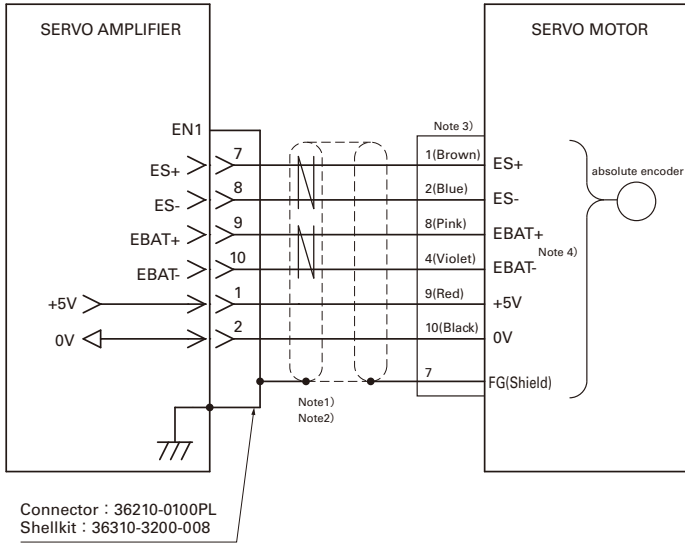
MODEL	Without Brake		With Brake		LG	KL1	KL2	KL3	LA	LB	LE	LH	LC
	LL	KB2	LL	KB2									
R2AA22500□□□□	163	52	216	106	16	142	21	38	235	200 <sup>0</sup> <sub>-0.046</sub>	4	270	220

LZ1	LZ2	LR	S	Q	QA	QK	W	T	U	KB1	QE	LT	IE	IF	IL1	IL2
13.5	M12	65	35 <sup>0</sup> <sub>-0.016</sub>	60	3	50	10 <sup>0</sup> <sub>-0.036</sub>	8	3	96	M8	25	142	60	48	35

# Encoder Wiring Diagram

Amplifier model Number : RS2A0\*



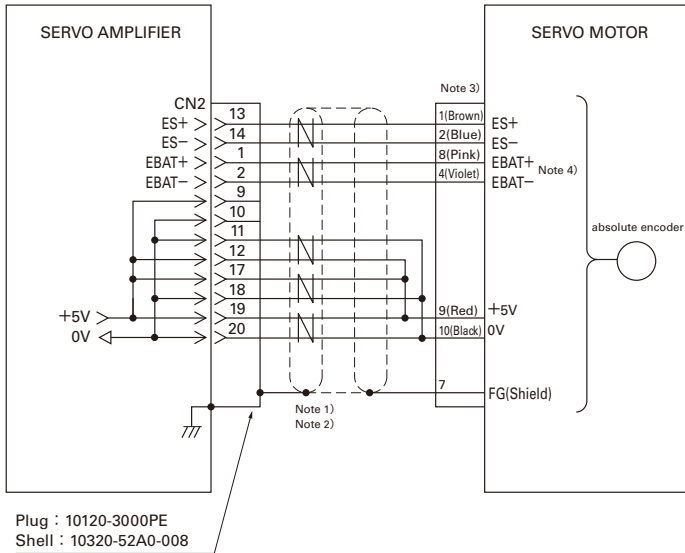
Battery backup method absolute encoder [ PA035C ]  
Absolute encoder for incremental system[ PA035S]  
Absolute encoder without battery[ RA035C]

- Note 1) Use an exterior covering shielded cable by a twisted pair.  
Note 2) Encoder cable must use conductor resistance value Max 1Ω by the total length.  
Note 3) Numbers are pin number for canon plug.  
Colors in parentheses are color of lead wire.

Servo motor Canon plug pin No.	1	2	8	4	9	10	7
Signal name	ES+	ES-	EBAT+	EBAT-	+5V	0V	FG(Shield)

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

Amplifier model Number : RS1A\*\*



Battery backup method absolute encoder [ PA035C ]  
Absolute encoder for incremental system[ PA035S]  
Absolute encoder without battery[ RA035C]

- Note 1) Use an exterior covering shielded cable by a twisted pair.  
Note 2) Encoder power connections depend on encoder cable length. See the following

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

Use a Awg24 0.2mm2 encoder cable.

- Note 3)

Servo motor Canon plug pin No.	1	2	8	4	9	10	7
Signal name	ES+	ES-	EBAT+	EBAT-	+5V	0V	FG(Shield)

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

## Notice

●The products shown in the catalog are subject to Japanese Export Control Law. Diversion contrary to the law of exporting country is prohibited.