

R88M-G□, R88M-GP□

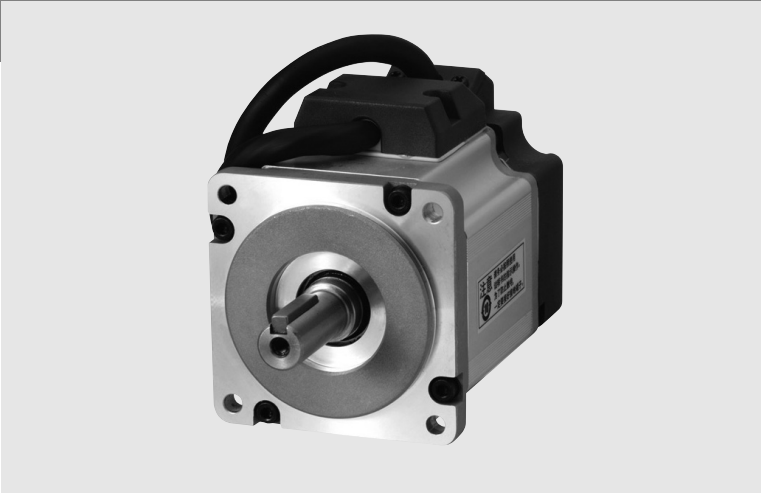
SmartStep 2 servo motors

Another step forward in drive simplicity

- SmartStep 2 motors can be controlled by G-Series drive
- Flange compatible with SmartStep servo motors
- Cylindrical and flat servo motor types are available
- Easy to setup, easy to operate. SmartStep 2 is as easy to use as a stepper motor
- Models with brake available
- Easy to connect to the drive using prebuilt cables

Ratings

- 230 VAC from 50 W to 400 W (0.16 Nm to 1.3 Nm)



AC Servo systems

System configuration

SmartStep 2 Servo motor

Power and encoder cables

R88M-GP (Flat type) Servo Motor 3,000 rpm (100-400 W)	R88M-G (cylindrical type) Servo Motor 3,000 rpm (50-400 W)
--	---

SmartStep 2 Servo Drive

Servo Drive controlled by pulses

Servo motor type designation

R88M-GP10030H-BOS2

SmartStep2 Servomotor

Motor Type

Blank: Cylinder type
P: Flat type

Capacity

050	50 W
100	100 W
200	200 W
400	400 W

Rated Speed (r/min)

30	3000
----	------

Shaft end specifications

Blank	Straight shaft, no key
S2	Straight, key, tapped

Oil seal specifications

Blank	No oil seal
O	Oil seal

Brake specifications

Blank	No brake
B	Brake

Voltage and encoder specifications

H: 230 V with incremental encoder

Servo motor / servo drive combination

Servo motor						Servo drive		
Family	Voltage	Speed	Rated torque	Capacity	Model	SmartStep2	G-Series	
Cylindric	50 - 400 W	230 V	3000 min ⁻¹	0.16 Nm	50 W	R88M-G05030H-□S2	R7D-BP01H	R88D-G□01H-□
				0.32 Nm	100 W	R88M-G10030H-□S2	R7D-BP01H	R88D-G□01H-□
				0.64 Nm	200 W	R88M-G20030H-□S2	R7D-BP02HH	R88D-G□02H-□
				1.3 Nm	400 W	R88M-G40030H-□S2	R7D-BP04H	R88D-G□04H-□
Flat	100-400W	230 V	3000 min ⁻¹	0.32 Nm	100 W	R88M-GP10030H-□S2	R7D-BP01H	R88D-G□01H-□
				0.64 Nm	200 W	R88M-GP20030H-□S2	R7D-BP02HH	R88D-G□02H-□
				1.3 Nm	400 W	R88M-GP40030H-□S2	R7D-BP04H	R88D-G□04H-□

Note: 1. For servo motor and cable part numbers, refer to ordering information at the end of this chapter.
 2. Refer to the servo drive chapter for drive options selection and detailed specifications.

Servo motor specifications

General specifications

Item	Specification
Ambient operating temperature	0 to 40°C
Ambient operating humidity	85% max. (with no condensation)
Ambient storage temperature	-20 to 65°C
Ambient storage humidity	85% max. (with no condensation)
Storage/operating atmosphere	No corrosive gases
Vibration resistance	49 m/s ² max. in the X, Y, and Z directions
Impact resistance	Acceleration of 98 m/s ² max. 3 times each in the X, Y, and Z directions
Insulation resistance	20 MΩ min. at 500 VDC between the power terminals and FG terminal
Dielectric strength	1,500 VAC (50 or 60 Hz) for 1 minute between the power terminals and FG terminal
Run position	Any direction
Insulation grade	Type B
Structure	Totally-enclosed, self-cooling
Protective structure	IP65 (excluding the through-shaft portion)
Vibration grade	V-15
Mounting method	Flange-mounting
International standards	Approval obtained for UL, cUL, and EN (EMC directive and low-voltage directive)

Performance specifications

Cylindric servo motors

Item	Unit	R88M-G05030H	R88M-G10030H	R88M-G20030H	R88M-G40030H	
Rated output	W	50	100	200	400	
Rated torque	N·m	0.16	0.32	0.64	1.3	
Rated rotation speed	r/min	3000				
Momentary maximum rotation speed	r/min	5000				
Momentary maximum torque	N·Em	0.48	0.95	1.78	3.60	
Rated current	A (rms)	1.1		1.6	2.6	
Momentary maximum current	A (rms)	3.4		4.9	7.9	
Rotor inertia	kg·m ²	2.5 × 10 ⁻⁶	5.1 × 10 ⁻⁶	1.4 × 10 ⁻⁵	2.6 × 10 ⁻⁵	
Power rate	kW/s	10.4	20.1	30.3	62.5	
Allowable radial load	N	68		245		
Allowable thrust load	N	58		98		
Weight	Without brake	kg	0.3	0.5	0.8	1.2
	With brake	kg	0.5	0.7	1.3	1.7
Encoder resolution	---	Phase A and B: 2,500 pulses/rotation, Phase Z: 1 pulse/rotation				
Radiation shield dimensions	---	100 × 80 × t10 (Al)		130 × 120 × t12 (Al)		
Brake specifications	Brake inertia	kg·m ²	2.0 × 10 ⁻⁷	2.0 × 10 ⁻⁷	1.8 × 10 ⁻⁶	7.5 × 10 ⁻⁶
	Excitation voltage	V	24 VDC ±10%			
	Power consumption (at 20 °C)	W	7		9	
	Current consumption (at 20 °C)	A	0.30		0.36	
	Static friction torque	N·m	0.29 min.		1.27 min.	
	Attraction time	ms	35 max.		50 max.	
	Release time	ms	20 max.		15 max.	
	Backlash	-	±1° max.			
	Rating	-	Continuous			
Brake life	-	10,000,000 operations min.				
Applicable servo driver (R7D-)		BP01H		BP02HH	BP04H	

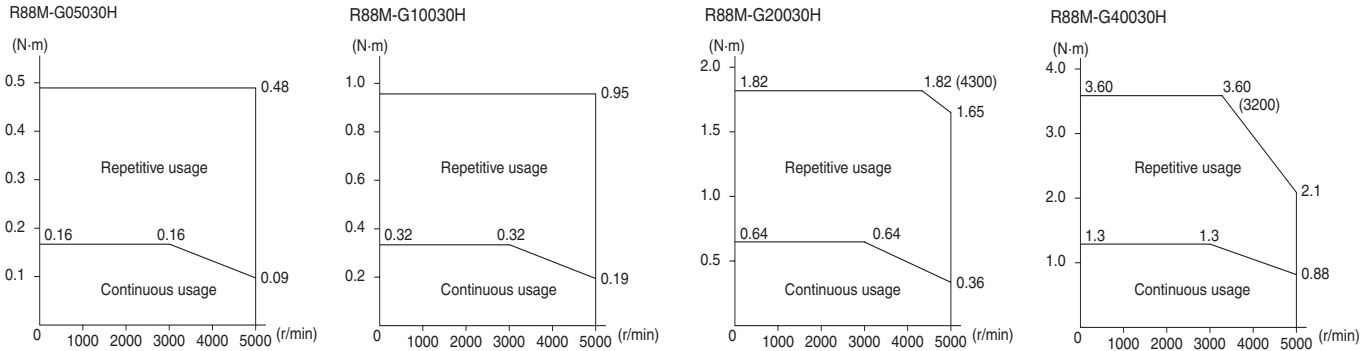
Flat servo motors

Item	Unit	R88M-GP10030H	R88M-G20030H	R88M-G40030H	
Rated output	W	100	200	400	
Rated torque	N·m	0.32	0.64	1.3	
Rated rotation speed	r/min	3000			
Momentary maximum rotation speed	r/min	5000			
Momentary maximum torque	N·Em	0.90	1.82	3.60	
Rated current	A (rms)	1.0	1.6	4.4	
Momentary maximum current	A (rms)	4.3	6.8	18.6	
Rotor inertia	kg·m ²	9.0 × 10 ⁻⁶	3.4 × 10 ⁻⁵	6.4 × 10 ⁻⁵	
Power rate	kW/s	11.4	11.8	25.5	
Allowable radial load	N	68	245		
Allowable thrust load	N	58	98		
Weight	Without brake	kg	1.3	1.8	
	With brake	kg	0.9	2.0	2.5
Encoder resolution	---	Phase A and B: 2,500 pulses/rotation, Phase Z: 1 pulse/rotation			
Radiation shield dimensions	---	130 × 120 × t10 (Al)		170 × 160 × t12 (Al)	
Brake specifications	Brake inertia	kg·m ²	3.0 × 10 ⁻⁶	9.0 × 10 ⁻⁶	9.0 × 10 ⁻⁶
	Excitation voltage	V	24 VDC ±10%		
	Power consumption (at 20 °C)	W	7	10	
	Current consumption (at 20 °C)	A	0.29	0.41	
	Static friction torque	N·m	0.29 min.		
	Attraction time	ms	50 max.	60 max.	
	Release time	ms	15 max.		
	Backlash	-	±1° max.		
	Rating	-	Continuous		
	Brake life	-	10,000,000 operations min.		
Applicable servo driver (R7D-)		BP01H	BP02HH	BP04	

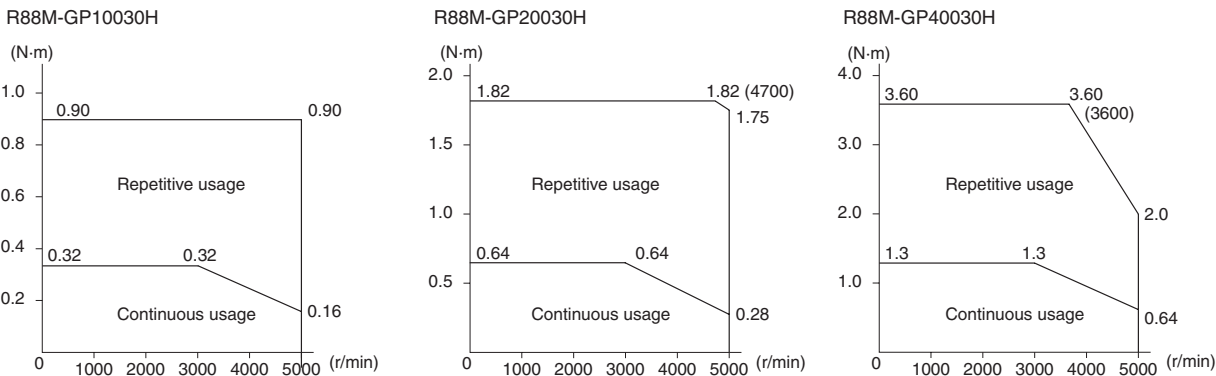
Torque-speed characteristics

The following graphs show the characteristics with a 3 m standard cable and R7D-AP□H servo driver (200 VAC input)

Cylindric servo motor



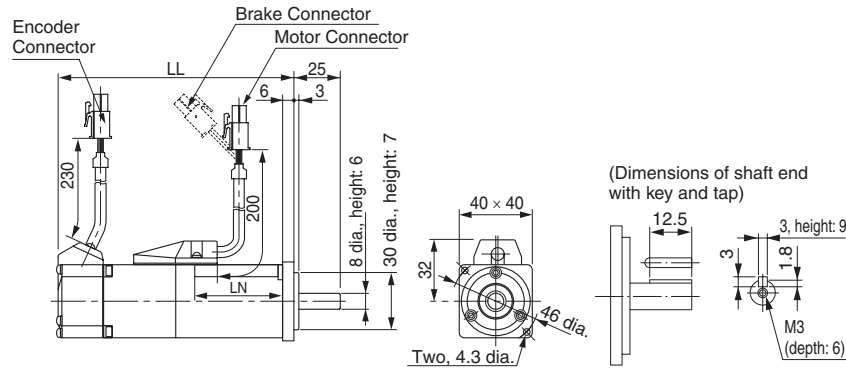
Flat servo motors



Dimensions

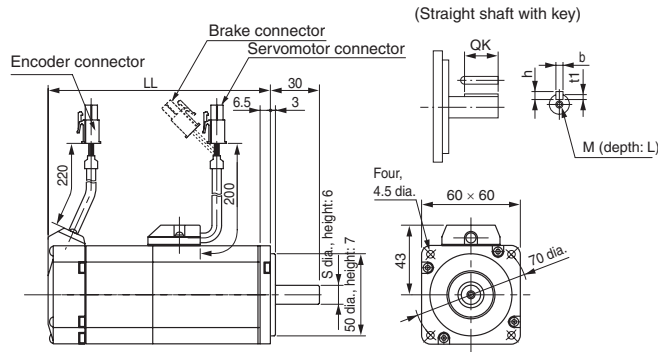
Cylindrical type 3000 r/min (230 V, 50 - 100W)

Dimensions (mm)	Without brake		With brake		LN	Aprox. Mass (Kg)	
	LL	LL	LL	LL		Without brake	With brake
R88M-G05030H-□S2	72	102	26.5	0.3		0.5	
R88M-G10030H-□S2	92	122	46.5	0.5		0.7	



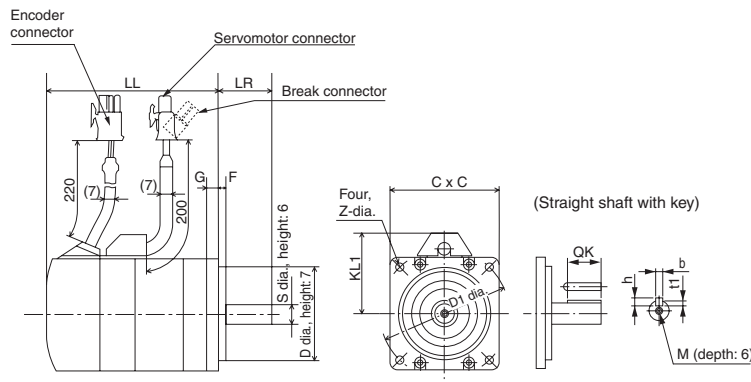
Cylindrical type 3000 r/min (230 V, 200 - 400W)

Dimensions (mm)	Without brake	With brake	LR	KL1	Flange surface					Shaft end						Aprox. Mass (Kg)		
					D1	D2	C	G	Z	S	QK	b	h	M	t1	L	Without brake	With brake
R88M-G20030H-□S2	79.5	116	30	43	70	50	60	6.5	4.5	11	18	4h9	4	M4	2.5	8	0.8	1.3
R88M-G40030H-□S2	99	135.5								14	22.5	5h9	5	M5	3	10	1.2	1.7
R88M-G75030H-□S2	112.2	149.2	35	53	90	70	80	8	6	19	22	6h9	6		3.5		2.3	3.1



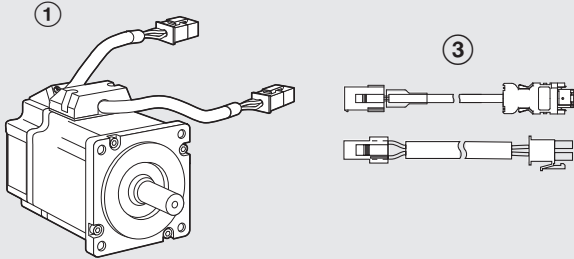
Flat type 3000 r/min (230 V, 100 W - 400 W)

Dimensions (mm)	Without brake	With brake	LR	KL1	Flange surface						Shaft end						Aprox. Mass (Kg)	
					D1	D2	C	F	G	Z	S	QK	b	h	t1	Tap x depth	Without brake	With brake
R88M-GP10030H-□S2	60.5	84.5	25	43	70	50	60	3	7	4.5	8	12.5	3h9	3	1.8	M3x6	0.7	0.9
R88M-GP20030H-□S2	67.5	100	30	53	90	70	80	5	8	5.5	11	18	4h9	4	2.5	M4x8	1.3	2
R88M-GP40030H-□S2	82.5	115									14	22.5	5h9	5	3.0	M5x10	1.8	2.5



Ordering information

SmartStep 2 Servo motor

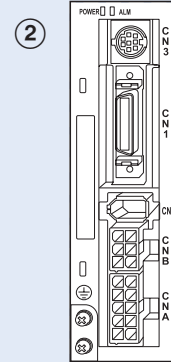


R88M-GP (Flat type) Servo Motor
3,000 rpm
(100-400 W)

R88M-G (cylindrical type) Servo Motor
3,000 rpm
(50-400 W)

SmartStep 2 Servo Drive

Servo Drive controlled by pulses



Note: The symbols ①②③... show the recommended sequence to select the servo motor and cables.

Servo motor

Cylindrical servo motors (3,000-r/min)

Symbol	Specifications				Servo motor model	Compatible servo drives ② SmartStep 2
	Design		Rated torque	Capacity		
①	Cylindrical servo motors (3,000-r/min) Straight shaft with key	Without brake	0.16 Nm	50 W	R88M-G05030H-S2	R7D-BP01H
			0.32 Nm	100 W	R88M-G10030H-S2	
			0.64 Nm	200 W	R88M-G20030H-S2	
			1.3 Nm	400 W	R88M-G40030H-S2	
		With brake	0.16 Nm	50 W	R88M-G05030H-BS2	
			0.32 Nm	100 W	R88M-G10030H-BS2	
			0.64 Nm	200 W	R88M-G20030H-BS2	
		1.3 Nm	400 W	R88M-G40030H-BS2	R7D-BP04H	

Flat servo motors (3,000-r/min)

Symbol	Specifications				Servo motor model	Compatible servo drives ② SmartStep 2
	Design		Rated torque	Capacity		
①	Flat servo motors (3,000-r/min) Straight shaft with key	Without brake	0.32 Nm	100 W	R88M-GP10030H-S2	R7D-BP01H
			0.64 Nm	200 W	R88M-GP20030H-S2	R7D-BP02HH
			1.3 Nm	400 W	R88M-GP40030H-S2	R7D-BP04H
		With brake	0.32 Nm	100 W	R88M-GP10030H-BS2	R7D-BP01H
			0.64 Nm	200 W	R88M-GP20030H-BS2	R7D-BP02HH
			1.3 Nm	400 W	R88M-GP40030H-BS2	R7D-BP04H

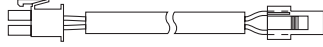
Servo drive

Note: 1. Refer to SmartStep 2 servo drive chapter for detailed drive specifications and selection of drive accessories.


AC Servo systems

Servo motor cables for SmartStep 2 drive

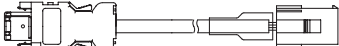
Power cables (for CNB)

Symbol	Specifications		Model	Appearance	
③	Power cables for SmartStep 2 Servo motors	Flexible cables shielded	1.5 m	R7A-CAB001-5SR-E	
			3 m	R7A-CAB003SR-E	
			5 m	R7A-CAB005SR-E	
			10 m	R7A-CAB010SR-E	
			15 m	R7A-CAB015SR-E	
			20 m	R7A-CAB020SR-E	

Brake cables

Symbol	Specifications		Model	Appearance	
③	Brake cables for SmartStep 2 Servo motors	Flexible cables	1.5 m	R88A-CAGA001-5BR-E	
			3 m	R88A-CAGA003BR-E	
			5 m	R88A-CAGA005BR-E	
			10 m	R88A-CAGA010BR-E	
			15 m	R88A-CAGA015BR-E	
			20 m	R88A-CAGA020BR-E	

Encoder cables (for CN2)

Symbol	Specifications		Model	Appearance	
③	Encoder cables for SmartStep 2 Servo motors	Flexible cables shielded	1.5 m	R88A-CRGB001-5CR-E	
			3 m	R88A-CRGB003CR-E	
			5 m	R88A-CRGB005CR-E	
			10 m	R88A-CRGB010CR-E	
			15 m	R88A-CRGB015CR-E	
			20 m	R88A-CRGB020CR-E	

Connectors

Specifications	Model
Encoder Input Connector (CN2)	R88A-CNW01R
Servomotor Connector for Encoder Cable	R88A-CNG02R
Servomotor Connector for Servomotor Power Cable	R88A-CNG01A
Brake Cable Connector	R88A-CNG01B

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.