SGM7J Series 200V Servo Motor

The SGM7J Series are capable of operating at 200V 1-phase or 3-phase. They are a medium inertia, high speed motor designed to be lightweight and have a compact footprint. It has an integrated 24-bit encoder resolution maintaining industry leading positional accuracy with torque ratings up to 2.39N-m at 3000RPM.

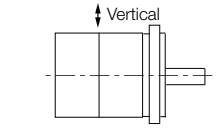
Specifications

Voltage		200V			
Model SGM7J-		02A	04A	06A	08A
Time Rating		Continuous			
Thermal Class		B			
Insulation Resistance		500 VDC, 10 MOhm min.			
Withstand Voltage		1,500 VAC for 1 minute			
Excitation		Permanent magnet			
Mounting		Flange-mounted			
Drive Method		Direct drive			
Rotation Direction		Counterclockwise (CCW) for forward reference when viewed from the load side			
Vibration Class*1		V15			
Environmental Conditions	Surrounding Air Temperature	0 °C to 40 °C (With derating, usage is possible between 40 °C and 60 °C)			
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)			
	Installation Site	• Must be indoors and free of corrosive and explosive gases. • Must be well-ventilated and free of dust and moisture. • Must facilitate inspection and cleaning. • Must have an altitude of 1,000 m or less. (With derating, usage is possible between 1,000 m and 2,000 m.) • Must be free of strong magnetic fields.			
	Storage Environment	Store the Servomotor in the following environment if you store it with the power cable disconnected. Storage Temperature: -20 °C to 60 °C (with no freezing) Storage Humidity: 20% to 80% relative humidity (with no condensation)			
Shock Resistance*2	Impact Acceleration Rate at Flange	490 m/s²			
	Number of Impacts	2 times			
Vibration Resistance*3	Vibration Acceleration Rate at Flange	49 m/s²			
Applicable SERVOPACKS	SGD7S-	1R6A	2R8A	5R5A	
	SGD7W-	2R8A	2R8A, 5R5A, 7R6A	5R5A, 7R6A	

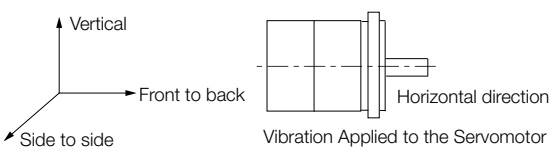
*1 A Vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the Servomotor without a load at the rated motor speed.

*2 The shock resistance for shock in the vertical direction when the Servomotor is mounted with the shaft in a horizontal position is given in the above table.

*3 The vertical, side-to-side, and front-to-back vibration resistance for vibration in three directions when the Servomotor is mounted with the shaft in a horizontal position is given in the above table. The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.



Shock Applied to the Servomotor



Vibration Applied to the Servomotor

Ratings

Voltage			200V			
Model SGM7J-			02A	04A	06A	08A
Rated Output *1		W	200	400	600	750
Rated Torque *1, *2		Nm	0.637	1.27	1.91	2.39
Instantaneous Maximum Torque *1		Nm	2.23	4.46	6.69	8.36
Rated Current *1		Arms	1.6	2.5	4.2	4.4
Instantaneous Maximum Current *1		Arms	5.8	9.3	15.3	16.9
Rated Motor Speed *1		min^{-1}	3000			
Maximum Motor Speed		min^{-1}	6000			
Torque Constant		Nm/Arms	0.444	0.544	0.493	0.584
Motor Moment of Inertia		$\times10^{-4}$ kg m²	0.263 (0.333)	0.486 (0.556)	0.800 (0.870)	1.59 (1.77)
Rated Power Rate *1		kW/s	15.4 (12.1)	33.1 (29.0)	45.6 (41.9)	35.9 (32.2)
Rated Angular Acceleration Rate *1		rad/s	24200 (19100)	26100 (22800)	23800 (21900)	15000 (13500)
Derating Rate for Servomotor with Oil Seal		%	90	95		
Heat Sink Size (Aluminium)		mm	250 × 250 × 6			
Protective Structure *3			Totally enclosed, self-cooled, IP67			
Holding Brake Specifications *4	Rated Voltage	V		24 VDC $\pm^{10\%}_{0}$		
	Capacity	W	6		6.5	
	Holding Torque	Nm	0.637	1.27	1.91	2.39
	Coil Resistance	Ω (at 20 °C)	96±10%		88.6±10%	
	Rated Current	A (at 20 °C)	0.25		0.27	
	Time Required to Release Brake	ms	60		80	
	Time Required to Brake	ms	100			
Allowable Load Moment of Inertia (Motor Moment of Inertia Ratio)			15 times	10 times	20 times	12 times
	With External Regenerative Resistor and Dynamic Brake Resistor					
Allowable Shaft Load *5	LF	mm	25			35
	Allowable Radial Load	N	245			392
	Allowable Thrust Load	N	74			147

Notes: The values in parentheses are for Servomotors with Holding Brakes.

*1 These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.

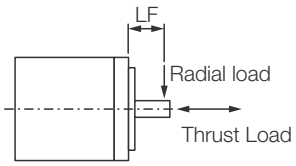
*2 The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminium heat sink of the dimensions given in the table.

*3 This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

*4 Observe the following precautions if you use a Servomotor with a Holding Brake.

- The holding brake cannot be used to stop the Servomotor.
- The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.
- The 24-VDC power supply is not provided by Matara.

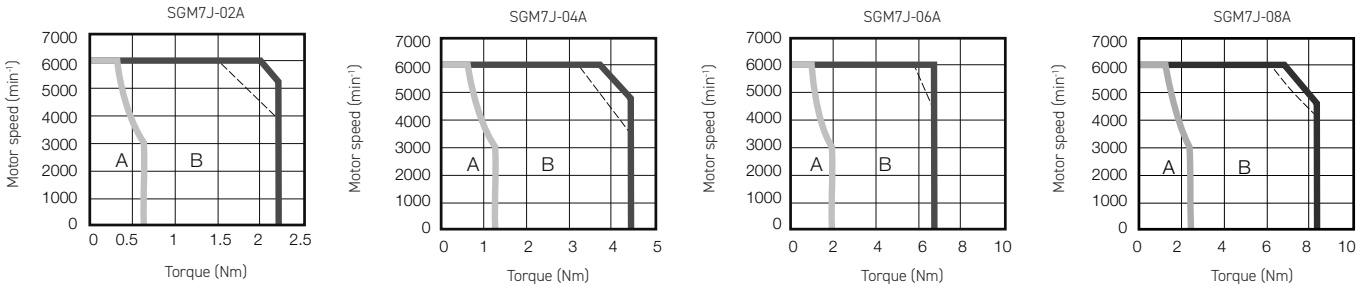
*5 The allowable shaft loads are illustrated in the following figure. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



Torque-Motor Speed Characteristics

A : Continuous duty zone
B : Intermittent duty zone

——— (solid lines): With three-phase 200-V or single-phase 230-V input
- - - - - - - - (dotted lines): With single-phase 200-V input



* The characteristics are the same for three-phase 200 V and single-phase 200 V.

Notes:

1 These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. These are typical values.

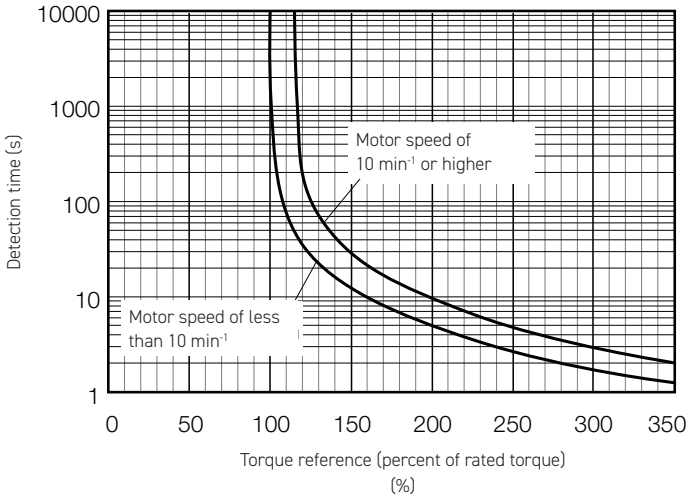
2 The characteristics in the intermittent duty zone depend on the power supply voltage.

3 If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.

4 If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torque-motor speed characteristics will become smaller because the voltage drop increases.

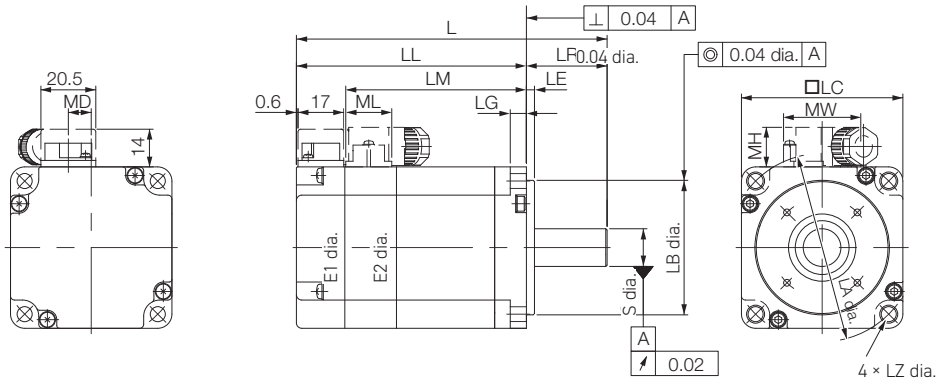
Servomotor Overload Protection Characteristics

The overload detection level is set for hot start conditions with a Servomotor surrounding air temperature of 40 °C.



Note:
The above overload characteristics does not give permission to perform continuous duty operation with an output of 100% or higher. Use the Servomotor so that the effective torque remains within the continuous duty zone given in Torque-Motor Speed Characteristics on page 51.

SGM7J-02, -04, -06, and -08



Unit: mm

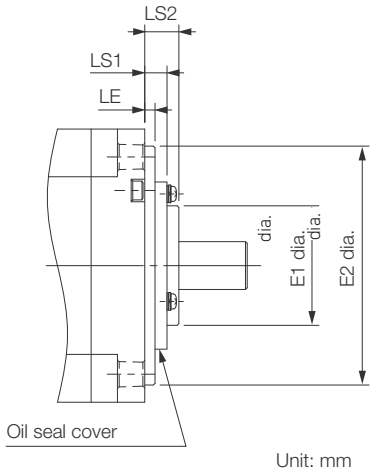
Model SGM7J-	L	LL	LM	Flange Dimensions							S
				LR	LE	LG	LC	LA	LB	LZ	
02A□A2□	99.5 (140)	69.5 (110)	51.2	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$
04A□A2□	115.5 (156)	85.5 (126)	67.2	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{-0.011}$
06A□A2□	137.5 (191.5)	107.5 (161.5)	89.2	30	3	6	60	70	$50^{0}_{-0.025}$	5.5	$14^{0}_{0.011}$
08A□A2□	137 (184)	97 (144)	78.5	40	3	8	80	90	$70^{0}_{-0.025}$	7	$19^{0}_{-0.013}$

Model SGM7J-	MD	MW	ML	ML	Approx. Mass (kg)
02A□A2□	8.5	28.7	14.7	17.1	0.8 (1.4)
04A□A2□	8.5	28.7	14.7	17.1	1.1 (1.7)
06A□A2□	8.5	28.7	14.7	17.1	1.6 (2.2)
08A□A2□	13.6	38	14.7	19.3	2.2 (2.8)

Notes:
1 The values in parentheses are for Servomotors with Holding Brakes.
2 Refer to the following section for detailed shaft end specifications.

Specifications of Options

Oil Seal



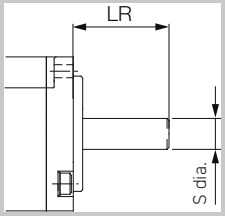
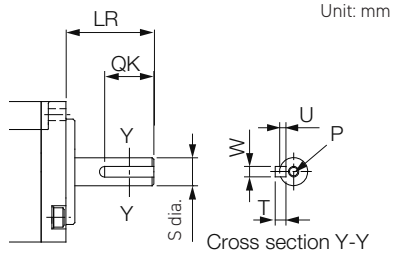
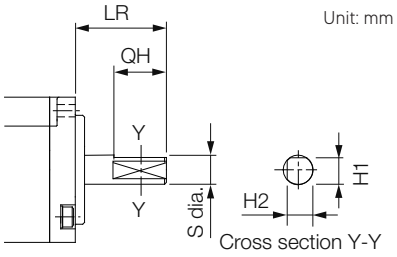
Unit: mm

Model SGM7J-	Model SGM7J-			
	E1	E2	LS1	LS2
02A, 04A, 06A	35	47	5.2	10
08A	47	61	5.5	11

Shaft End Specifications

SGM7J-□□□□□□□

Code	Specification
2	Straight without key
6	Straight with key and tap (Key slot is JIS B1301-1996 fastening type.)
B	With two flat seats

Code		Specification			
		02	04	06	08
Code: 2 (Straight without Key)					
 Unit: mm	LR	30			40
	S	$14^{0}_{-0.011}$			$19^{0}_{-0.013}$
Code: 6 (Straight with Key and Tap)					
 Unit: mm	LR	30			40
	QK	14			22
	S	$14^{0}_{-0.011}$			$19^{0}_{-0.013}$
	W	5			6
	T	5			6
	U	3			3.5
	P	M5 × 8L			M6 × 10L
Code: B (with Two Flat Seats)					
 Unit: mm	LR	30			40
	QH	15			22
	S	$14^{0}_{-0.011}$			$19^{0}_{-0.013}$
	H1	13			18
	H2	13			18

SGM7J Order Example

Code:	SGM7J	-	02		A	-	F	-	A	-	6	-	1
Options:	1		2		3		4		5		6		7

Options		Selection			
1	Series	SGM7A			
2	Rated Output	02: 200W	04: 400W	06: 600W	08: 800W
3	Power Supply Voltage	A: 200 VAC			
4	Serial Encoder	7: 24-bit Absolute **F: 24-bit Incremental**			
5	Design Revision Order	A: Initial Design			
6	Shaft End	2: Straight without Key **6: Straight with Key and Tap** B: With two flat seats			
7	Options	**1: Without Options** C: With Holding Brake (24 VDC) E: With oil seal and holding brake (24 VDC) S: With oil seal			

Note:
The **bolded** options are standard stock.