

SGMXJ

Model Designations

SGMXJ - 01 A U A 2 1 A 1

Σ-X-Series
Servomotor
SGMXJ model

1st+2nd digits

3rd digit

4th digit

5th digit

6th digit

7th digit

8th digit

9th digit

1st+2nd digits Rated Output

Code	Specification
A5	50 W
01	100 W
C2	150 W
02	200 W
04	400 W
06	600 W
08	750 W

3rd digit Power Supply Voltage

Code	Specification
A	200 VAC

4th digit Serial Encoder

Code	Specification
U	26-bit absolute encoder
W	26-bit batteryless absolute encoder

5th digit Design Revision Order

A

6th digit Shaft End

Code	Specification
2	Straight without key
6	Straight with key and tap
B	With two flat seats

7th digit Options

Code	Specification
1	Without options
C	With holding brake (24 VDC)
E	With oil seal With holding brake (24 VDC)
S	With oil seal

8th digit Destination

A

9th digit Ancillary Specification

Code	Specification
1	Standard
2	Σ-7 compatible

Specifications and Ratings

Specification

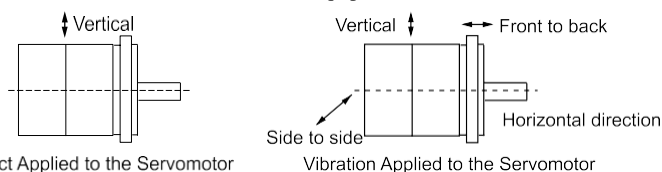
Voltage	200 V						
Model SGMXJ-	A5A	01A	C2A	02A	04A	06A	08A
Time Rating	Continuous						
Thermal Class	UL: B, CE: B						
Insulation Resistance	500 VDC, 10 MΩ min.						
Withstand Voltage	1,500 VAC for 1 minute						
Excitation	Permanent magnet						
Mounting	Flange-mounted						
Drive Method	Direct drive						
Rotation Direction	Counterclockwise (CCW) for forward reference when viewed from the load side						
Vibration Class <i>*J</i>	V15						


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Voltage		200 V						
Model SGMXJ-		A5A	01A	C2A	02A	04A	06A	08A
Environmental Conditions	Surrounding Air Temperature	0°C to 40°C (With derating, usage is possible between 40°C and 60°C.) *3						
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)						
	Installation Site	<ul style="list-style-type: none"> • 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 1000 m or less. (With derating, usage is possible between 1000 m and 2000 m.) *3 • 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)						
Impact Resistance *2	Impact Acceleration (at Flange)	490 m/s ²						
	Number of Impacts	2 times						
Vibration Resistance *2	Vibration Acceleration (at Flange)	49 m/s ²						
Applicable SERVOPACKS	SGDXS-	R70A	R90A	1R6A	1R6A	2R8A	5R5A	5R5A
	SGDXW-	1R6A *4, 2R8A *4	1R6A *4, 2R8A *4	1R6A, 2R8A *4	1R6A, 2R8A *4	2R8A, 5R5A *4, 7R6A *4	5R5A, 7R6A	5R5A, 7R6A
	SGDXT-	1R6A *4, 2R8A *4	1R6A *4, 2R8A *4	1R6A, 2R8A *4	1R6A, 2R8A *4	2R8A	-	-

- *1 A vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the servomotor without a load at the rated rotation speed.
- *2 The given values are for when the servomotor shaft is mounted horizontally and impact or vibration is applied in the directions shown in the following figures. The strength of the vibration that the servomotor can withstand depends on the application. Always check the vibration acceleration that is applied to the servomotor with the actual equipment.



- *3 Refer to the following section for the derating rates.
 [Derating Rates on page 60](#)
- *4 If you use this combination, performance may not be as good, e.g., the control gain may not increase, in comparison with using a Σ-XS SERVOPACK.

Servomotor Ratings

Voltage		200 V						
Model SGMXJ-		A5A	01A	C2A	02A	04A	06A	08A
Rated Output *1	W	50	100	150	200	400	600	750
Rated Torque *1, *2	N·m	0.159	0.318	0.477	0.637	1.27	1.91	2.39

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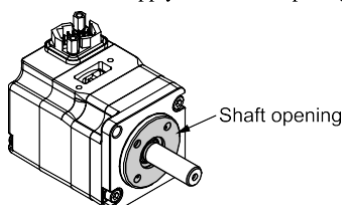
Voltage		200 V							
Model SGMXJ-		A5A	01A	C2A	02A	04A	06A	08A	
Instantaneous Maximum Torque ^{*1}	N·m	0.557	1.11	1.67	2.23	4.46	6.69	8.36	
Rated Current ^{*1}	Arms	0.55	0.85	1.6	1.6	2.5	4.2	4.4	
Instantaneous Maximum Current ^{*1}	Arms	2.0	3.1	5.7	5.8	9.3	15.3	16.9	
Rated Rotation Speed ^{*1}	min ⁻¹	3000							
Continuous Allowable Rotation Speed	min ⁻¹	7000				6000			
Maximum Rotation Speed ^{*1}	min ⁻¹	7000							
Torque Constant	N·m/Arms	0.316	0.413	0.321	0.444	0.544	0.493	0.584	
Rotor Moment of Inertia	Without Holding Brakes	× 10 ⁻⁴ kg·m ²	0.0421	0.0669	0.0946	0.263	0.486	0.800	1.59
	With Holding Brakes		0.0501	0.0749	0.103	0.323	0.546	0.860	1.76
	Without Holding Brake and with Batteryless Absolute Encoder		0.0458	0.0706	0.0983	0.267	0.490	0.804	1.59
	With Holding Brake and Batteryless Encoder		0.0538	0.0786	0.107	0.327	0.550	0.864	1.76
Rated Power Rate ^{*1}	Without Holding Brakes	kW/s	6.00	15.1	24.0	15.4	33.1	45.6	35.9
	With Holding Brakes		5.04	13.5	22.1	12.5	29.5	42.4	32.4
Rated Angular Acceleration ^{*1}	Without Holding Brakes	rad/s ²	37700	47500	50400	24200	26100	23800	15000
	With Holding Brakes		31700	42400	46400	19700	23200	22200	13500
Derating Rate for Servomotor with Oil Seal	%	80	90			95			
Heat Sink Size (aluminum) ^{*3}	mm	200 × 200 × 6			250 × 250 × 6				
Protective Structure ^{*4}	Totally enclosed, self-cooled, IP67								

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Voltage			200 V						
Model SGMJ-			A5A	01A	C2A	02A	04A	06A	08A
Holding Brake Specifications *5	Rated Voltage	V	24 VDC ±10%						
	Capacity	W	5.5			6		6.5	
	Holding Torque	N·m	0.159	0.318	0.477	0.637	1.27	1.91	2.39
	Coil Resistance	Ω (at 20°C)	104.8 ±10%			96 ±10%		88.6 ±10%	
	Rated Current	A (at 20°C)	0.23			0.25		0.27	
	Time Required to Release Brake	ms	60					80	
	Time Required to Brake	ms	100						
Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio) *6	At 6000 min ⁻¹		35 times	35 times	35 times	15 times	10 times	20 times	12 times
	At 7000 min ⁻¹					10 times	5 times	15 times	8 times
	With External Regenerative Resistor and External Dynamic Brake Resistor *7	At 6000 min ⁻¹ At 7000 min ⁻¹	35 times	35 times	35 times	25 times	25 times	20 times	15 times
Allowable Shaft Loads *8	LF	mm	20			25		35	
	Allowable Radial Load	N	78			245		392	
	Allowable Thrust Load	N	54			74		147	

- *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 aluminum heat sink of the dimensions given in the table.
- *3 Refer to the following section for the relation between the heat sinks and derating rate.
 [Servomotor Heat Dissipation Conditions on page 60](#)
- *4 This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

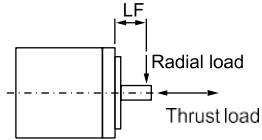


- *5 Observe the following precautions if you use a servomotor with a holding brake.
- The holding brake cannot be used to stop the servomotor.
 - The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.
 - The 24-VDC power supply is not provided by Yaskawa.
- *6 The rotor moment of inertia scaling factor is the value for a standard servomotor without a holding brake.

*7 To externally connect a dynamic brake resistor, select hardware option specification 0020 for the SERVOPACK. However, you cannot externally connect a dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

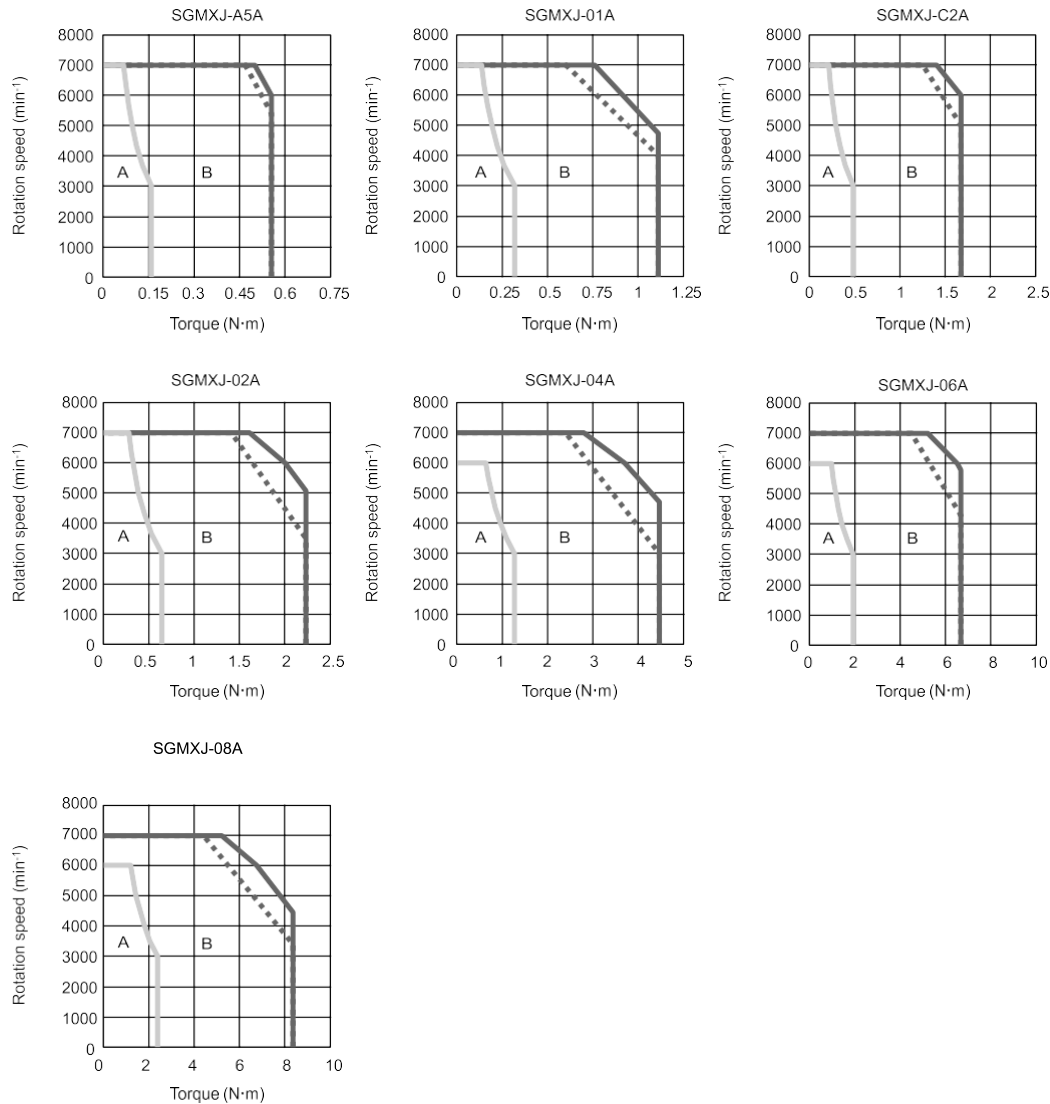
- SGDXS-R70A□□A0020 to -2R8A□□A0020
- SGDXW-1R6A□□A0020, -2R8A□□A0020
- SGDXT-1R6A□□A0020, -2R8A□□A0020

*8 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-Rotation Speed Characteristics

A : Continuous duty zone — (solid lines): Three-phase, 200 V
B : Intermittent duty zone — · (dotted lines): Single-phase, 200 V

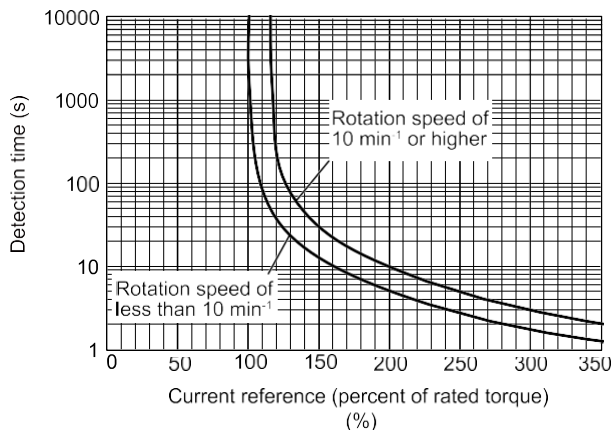


- Note:**
1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.
 2. The characteristics in the intermittent duty zone depend on the power supply voltage.
 3. If the effective torque is within the allowable range for the 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-rotation 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.

For the overload detection level, priority is given to the lower of the detection levels in the overload protection characteristics of the connected SERVOPACK and servomotor.



Note:

The above overload protection characteristics do not mean that you can 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-Rotation Speed Characteristics on page 58](#)".

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the servomotors are given in "[Servomotor Ratings on page 55](#)". The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the servomotor. Use the SigmaSize+ AC servo capacity selection program *1 to check the driving conditions. Perform the required steps for each of the following cases.

*1 Contact your Yaskawa representative for information on this program.

■ Exceeding the Allowable Load Moment of Inertia

Use one of the following measures to adjust the load moment of inertia to within the allowable value.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.

If the above steps is not possible, install an external regenerative resistor.

Information An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320).

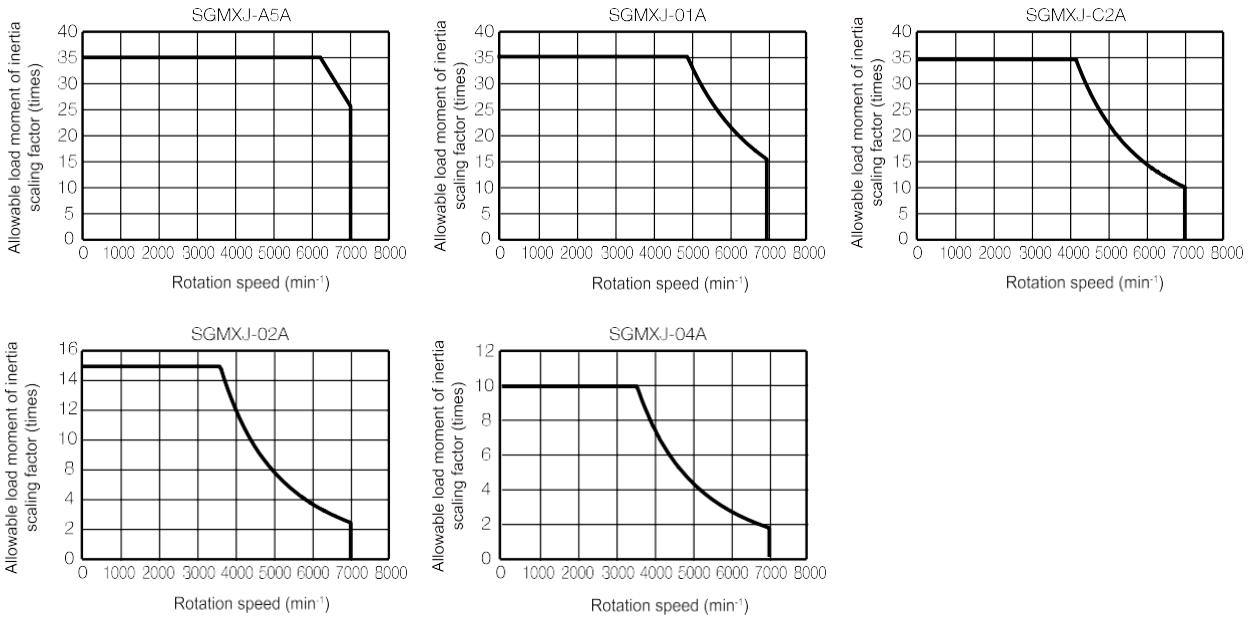
Refer to the following section for the regenerative power (W) that can be processed by the SERVOPACKs.

[Specifications of Built-in Regenerative Resistors in SERVOPACKs on page 573](#)

Install an external regenerative resistor when the built-in regenerative resistor cannot process all of the regenerative power.

■ SERVOPACKs without Built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the rotation speed (reference values for deceleration operation at or above the rated torque). Application is possible without an external regenerative resistor within the allowable value. However, for the shaded areas of the graphs, use Yaskawa's SigmaSize+, an AC servo drive capacity selection program, to select an external regenerative resistor.



Note:
Applicable SERVOPACK Model: SGDXS-R70A, -90A, -1R6A, -2R8A

■ When an External Regenerative Resistor Is Required

Install the external regenerative resistor which is selected with the SigmaSize+. Contact your Yaskawa representative for information on SigmaSize+.

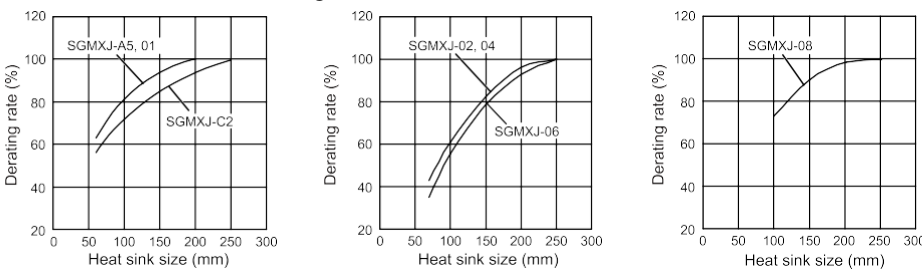
Refer to the following section for details on the external regenerative resistors.

[Specifications and Dimensions of External Regenerative Resistors on page 574](#)

Derating Rates

■ Servomotor Heat Dissipation Conditions

The servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C when a heat sink is installed on the servomotor. If the servomotor is mounted on a small device component, the servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate.



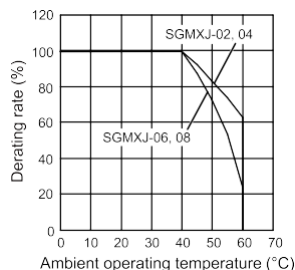
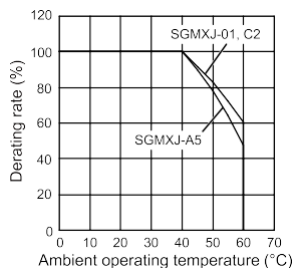
Important

The actual temperature rise depends on the following conditions. Always check the servomotor temperature with the actual equipment.

- How the heat sink (the servomotor mounting section) is attached to the installation surface
- Status between heat sink and servomotor (sealant, reduction gear, etc.)
- What material is used for the servomotor mounting section
- Servomotor rotation speed

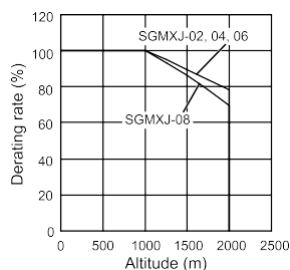
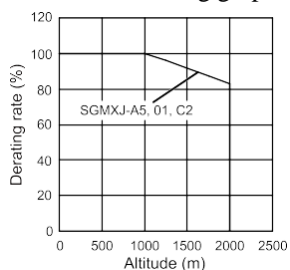
■ Applications Where the Surrounding Air Temperature Exceeds 40°C

The servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C. If you use a servomotor at a surrounding air temperature that exceeds 40°C (60°C max.), apply a suitable derating rate from the following graphs.



■ Applications Where the Altitude Exceeds 1000 m

The servomotor ratings are the continuous allowable values at an altitude of 1000 m or less. If you use a servomotor at an altitude that exceeds 1000 m (2000 m max.), the heat dissipation effect of the air is reduced. Apply the appropriate derating rate from the following graphs.



Note:

- When using servomotors with derating, change the detection timing of overload warning and overload alarm based on the overload detection level of the motor given in "[Servomotor Overload Protection Characteristics on page 59](#)".
- Use the combination of the SERVOPACK and servomotor so that the derating conditions are satisfied for both the SERVOPACK and servomotor.
- The derating rates are applicable only when the average rotation speed is less than or equal to the rated rotation speed. If the average rotation speed exceeds the rated rotation speed, consult with your Yaskawa representative.