

Ratings and Specifications

Time Rating: Continuous

Vibration Class: V15

Insulation Resistance: 500 VDC, 10 MΩ min.

Ambient Temperature: 0 to 40°C

Excitation: Permanent magnet

Mounting: Flange-mounted

Foot-mounted

Thermal Class: F

Withstand Voltage: 1500 VAC for one minute (200-V class)

1800 VAC for one minute (400-V class)

Enclosure: Totally enclosed, separately cooled, IP44
(except for shaft opening)

Ambient Humidity: 20% to 80% (no condensation)

Rotation Direction: Counterclockwise (CCW) with forward run reference
when viewed from the load side

200-V Class

Servomotor Model: SGMVV-□□□□□		2BA□B	3ZA□B	3GA□B	2BA□D	3ZA□D	3GA□D
Rated Output*	kW	22	30	37	22	30	37
Rated Torque*	Nm	140	191	236	262	358	442
Stall Torque*	Nm	140	191	236	262	358	442
Instantaneous Peak Torque*	Nm	350	478	589	526	752	930
Rated Current*	A_{rms}	88	120	152	104	150	195
Instantaneous Max. Current*	A_{rms}	240	340	460	240	340	460
Rated Speed*	RPM	1500			800		
Max. Speed*	RPM	2000			1300		
Torque Constant	Nm/ A_{rms}	1.72	1.72	1.68	2.73	2.50	2.34
Rotor Moment of Inertia	$\times 10^{-4}$ kg-m ²	366 (451)	498 (583)	595 (665)	705 (775)	1290 (1448)	1564 (1722)
Rated Power Rate*	kW/s	536 (434)	733 (626)	933 (836)	977 (888)	996 (885)	1250 (1135)
Rated Angular Acceleration*	rad/s ²	3830 (3100)	3840 (3280)	3960 (3550)	3720 (3380)	2780 (2470)	2830 (2570)
Applicable SERVOPACK	SGDV-□□□□□	121H	161H	201H	121H	161H	201H
Applicable Converter	SGDV-COA□□□□□	2BAA	3GAA	3GAA	2BAA	3GAA	3GAA

*: These items and torque-motor speed characteristics quoted in combination with a SERVOPACK are at an armature winding temperature of 20°C.

Notes: 1 The values in parentheses are for servomotors with holding brakes.

2 The above specifications show the values under the cooling condition when the following heat sinks are mounted on the servomotors.

SGMVV-2BA□B/-3ZA□B/-3GA□B/-2BA□D: 650×650×35 mm (iron)

SGMVV-3ZA□D/-3GA□D: 740×520×27 mm (iron)

400-V Class

Servomotor Model: SGMVV-□□□□□		2BD□B	3ZD□B	3GD□B	4ED□B	5ED□B	2BD□D	3ZD□D	3GD□D	4ED□D	
Rated Output*	kW	22	30	37	45	55	22	30	37	45	
Rated Torque*	Nm	140	191	236	286	350	262	358	442	537	
Stall Torque*	Nm	140	191	236	286	350	262	358	442	537	
Instantaneous Peak Torque*	Nm	350	478	589	715	875	526	752	930	1182	
Rated Current*	A_{rms}	44	60	76	102	117	52	75	98	110	
Instantaneous Max. Current*	A_{rms}	120	170	230	280	340	120	170	230	280	
Rated Speed*	RPM	1500					800				
Max. Speed*	RPM	2000					1300				
Torque Constant	Nm/ A_{rms}	3.44	3.44	3.37	3.09	3.15	5.46	5.00	4.68	5.21	
Rotor Moment of Inertia	$\times 10^{-4}$ kg-m ²	366 (451)	498 (583)	595 (665)	1071 (1229)	1290 (1448)	705 (775)	1290 (1448)	1564 (1722)	1804	
Rated Power Rate*	kW/s	536 (434)	733 (626)	935 (836)	765 (667)	949 (847)	977 (888)	996 (885)	1250 (1135)	1600	
Rated Angular Acceleration*	rad/s ²	3830 (3100)	3840 (3280)	3970 (3550)	2670 (2330)	2710 (2420)	3720 (3380)	2780 (2470)	2830 (2570)	2980	
Applicable SERVOPACK	SGDV-□□□□□	750J	750J	101J	131J	131J	750J	750J	101J	131J	
Applicable Converter	SGDV-COA□□□□□	3ZDA	3ZDA	5EDA	5EDA	5EDA	3ZDA	3ZDA	5EDA	5EDA	

*: These items and torque-motor speed characteristics quoted in combination with a SERVOPACK are at an armature winding temperature of 20°C.

Notes: 1 The values in parentheses are for servomotors with holding brakes.

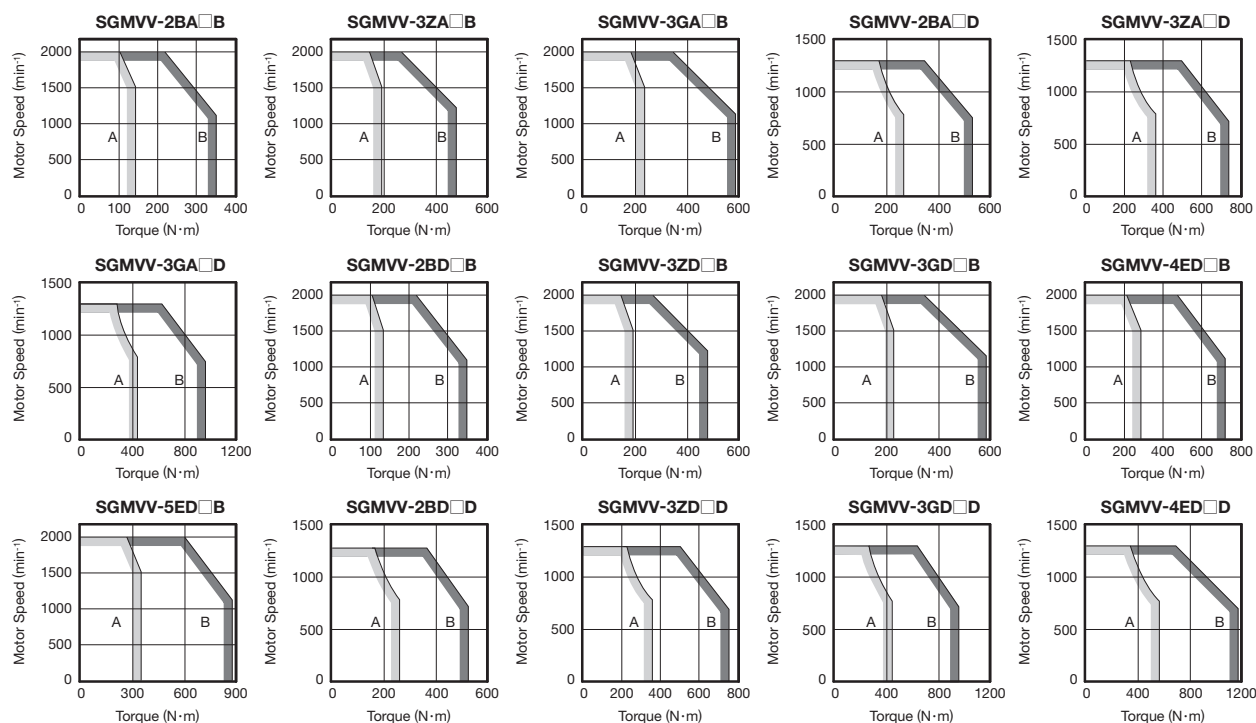
2 The above specifications show the values under the cooling condition when the following heat sinks are mounted on the servomotors.

SGMVV-2BD□B/-3ZD□B/-3GD□B/-2BD□D: 650×650×35 mm (iron)

SGMVV-4ED□B/-5ED□B/-3ZD□D/-3GD□D/-4ED□D: 740×520×27 mm (iron)

Ratings and Specifications

● Torque-Motor Speed Characteristics A: Continuous Duty Zone B: Intermittent Duty Zone



Notes: 1 When the effective torque is within the rated torque, the servomotor can be used within the intermittent duty zone.
 2 When the main circuit cable length exceeds 20 m, note that the intermittent duty zone of the *Torque-Motor Speed Characteristics* will shrink as the line-to-line voltage drops.

● Holding Brake Electrical Specifications

Servomotor Model SGMVV-	Rated Speed RPM	Rated Output kW	Holding Brake Specifications				
			Holding Torque Nm	Rated Voltage 24 VDC		Rated Voltage 90 VDC	
				Capacity W	Rated Current A (at 20°C)	Capacity W	Rated Current A (at 20°C)
2B□□B	1500	22	238	54	2.24	54	0.60
3Z□□B		30	238	54	2.24	54	0.60
3G□□B		37	345	54	2.24	54	0.60
4ED□B		45	429	60	2.50	60	0.67
5ED□B		55	429	60	2.50	60	0.67
2B□□D	800	22	345	54	2.24	54	0.60
3Z□□D		30	429	60	2.50	60	0.67
3G□□D		37	573	60	2.50	60	0.67

Notes: 1 The holding brake is only used to hold the load and cannot be used to stop the servomotor.
 2 The holding brake open time and holding brake operation time vary depending on which discharge circuit is used. Make sure holding brake open time and holding brake operation time are correct for your servomotor.
 3 A 24-VDC power supply is not included.
 4 For information on a 90-VDC power supply, refer to page 55.

● Cooling Fan Specifications

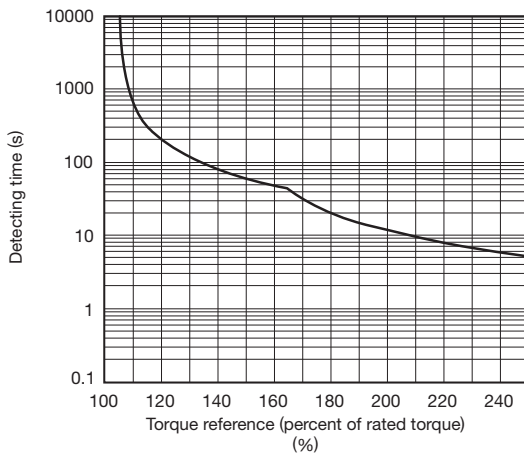
Main Circuit Power Supply Voltage	Servomotor Model SGMVV-	Specifications		
		Frequency Hz	Rated Input W	Rated Current A
Three-phase 200 VAC	2BA□□	50	100	0.29
		60	140	0.40
	3ZA□□	50	100	0.29
		60	140	0.40
	3GA□□	50	100	0.29
		60	140	0.40
Three-phase 400 VAC	2BD□□	50	75	0.14
		60	105	0.16
	3ZD□□	50	75	0.14
		60	105	0.16
	3GD□□	50	75	0.14
		60	105	0.16
	4ED□B	50	75	0.14
		60	105	0.16
	4ED□D	50	130	0.38
		60	170	0.36
5ED□B	50	75	0.14	
	60	105	0.16	

Ratings and Specifications

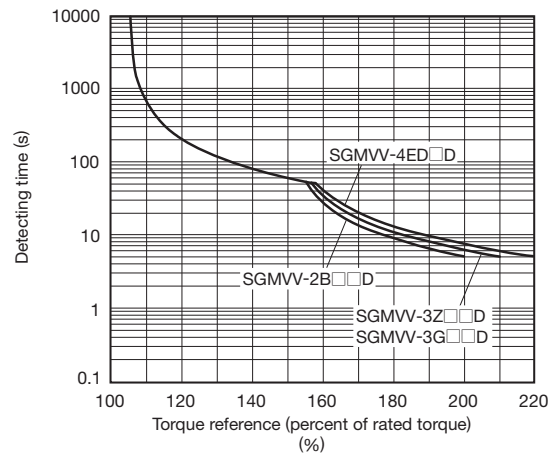
● Overload Characteristics

The overload detection level is set under hot start conditions at a servomotor ambient temperature of 40°C.

Motors with Rated Speed of 1,500 RPM



Motors with Rated Speed of 800 RPM



Note: Overload characteristics shown above do not guarantee continuous duty of 100% or more output. Use a servomotor with effective torque within the continuous duty zone of *Torque-Motor Speed Characteristics*.

● Allowable Load Moment of Inertia at the Motor Shaft

The rotor moment of inertia ratio is the value for a servomotor without a gear and a holding brake.

Servomotor Model SGMVV-	Servomotor Rated Output	Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)
2B to 5E	22 to 55 kW	10 times

● Load Moment of Inertia

The larger the load moment of inertia, the worse the movement response.

The allowable load moment of inertia (J_L) depends on the motor capacity, as shown above. This value is provided strictly as a guideline and results may vary depending on servomotor drive conditions.

Use the AC servo drive capacity selection program SigmaJunmaSize+ to check the operation conditions. The program can be downloaded for free from our web site (<http://www.e-mechatronics.com/>).

An overvoltage alarm (A.400) or a regeneration overload alarm (A.320) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. Take one of the following steps if this occurs.

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

If you cannot clear the alarm with the above steps, consider changing the capacity of the external regenerative resistor. Refer to *Regenerative Resistor Capacity Selection* on page 66.

● Allowable Radial and Thrust Loads

Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table.

Servomotor Model SGMVV-	Rated Speed RPM	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
2B□□B	1500	5880	2156	100	
3Z□□B		6272	2156	100	
3G□□B		7448	2156	100	
4ED□B		7840	2156	100	
5ED□B		8428	2156	110	
2B□□D	800	7448	2156	100	
3Z□□D		8428	2156	110	
3G□□D		8428	2156	110	
4ED□D		10100	2156	120	

Precautions on Servomotor Installation

The service life of the servomotor will be shortened or unexpected problems will occur if the servomotor is installed incorrectly or in an inappropriate location. Always observe the following installation instructions.

CAUTION

- Do not connect the servomotor directly to a commercial power line. This will damage the servomotor.
The servomotor cannot operate without the proper SERVOPACK.

(1) Installation Environment

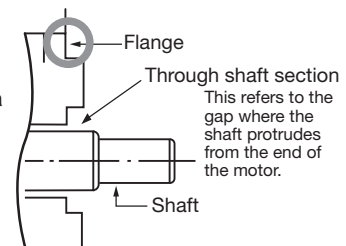
Items	Condition
Ambient Temperature	0 to 40°C (no freezing)
Ambient Humidity	20% to 80%RH (no condensation)
Installation Site	<ul style="list-style-type: none"> Free of corrosive or explosive gases. Well-ventilated and free of dust and moisture. Facilitates inspection and cleaning. <ul style="list-style-type: none"> Elevation: 1,000 m max. Free of high magnetic field
Storage Environment	Store the servomotor in the following environment if it is stored with the power cable disconnected. Ambient temperature during storage: -20 to +60°C (no freezing) Ambient humidity during storage: 20% to 80%RH (no condensation)

(2) Enclosure

The enclosure* of the servomotor is totally enclosed, separately cooled IP44.

* : Except through shaft section. The enclosure specification can be satisfied only when using a specified cable.

- Do not use servomotors in a location that is subject to oil. If the servomotor is used in a location that is subject to water or oil mist, order a servomotor with an oil seal to seal the through shaft section.



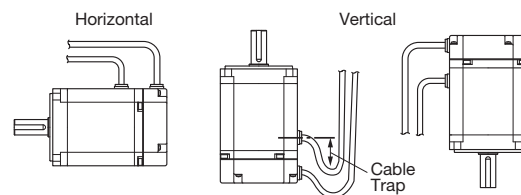
Precautions on Using Servomotor with Oil Seal:

- Put the oil surface under the oil seal lip.
- Use the oil seal in favorably lubricated condition.
- When using the servomotor with its shaft upward direction, be sure that oil will not stay in the oil seal lip.

(3) Orientation

- The allowable mounting directions of the servomotor depend on the mounting method.

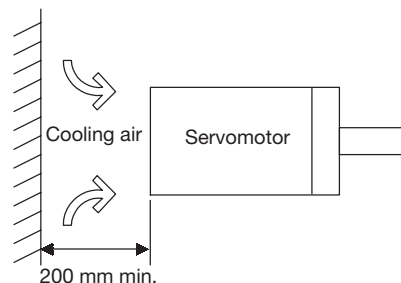
Mounting Method	Holding Brake	Allowable Mounting Directions
Flange-mounted	No	Vertical or horizontal
	Yes	Horizontal
Foot-mounted	No	
	Yes	



Note: When installing servomotors vertically, make cable traps to keep out water. When mounting servomotors with the shaft up, take measures with the connected machine to prevent oil from getting into the servomotors through gear boxes etc.

Servomotor Fan Installation Space

To prevent decreasing the cooling capacity of the servomotor fan, provide a space of at least 200 mm on the air inlet side of the servomotor as shown in the figure at the right.



Precautions on Servomotor Installation

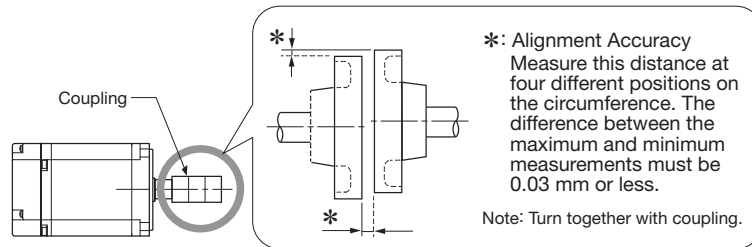
(4) Alignment

Align the shaft of the servomotor with the shaft of the equipment, and then couple the shafts.

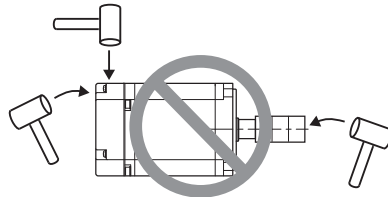
IMPORTANT

1 Install the servomotor so that alignment accuracy falls within the following range.

Vibration that will damage the bearings and encoders if the shafts are not properly aligned.



2 Do not allow any direct impact to the shafts when installing the couplings. Do not hit the area near encoders with a hammer etc., as impacts may damage the encoders.



3 Before installation, thoroughly remove the anticorrosive paint from the end of the motor shaft. Only after removing the paint can servomotors be installed on the machines.



(5) Cable Stress

- Make sure there is no bending or tension on the cables themselves, the connections, or the cable lead inlets. Be especially careful to wire encoder cables so that they are not subject to stress because the core wires of encoder cables are very thin at only 0.2 to 0.3 mm².

(6) Precautions on Cable Usage

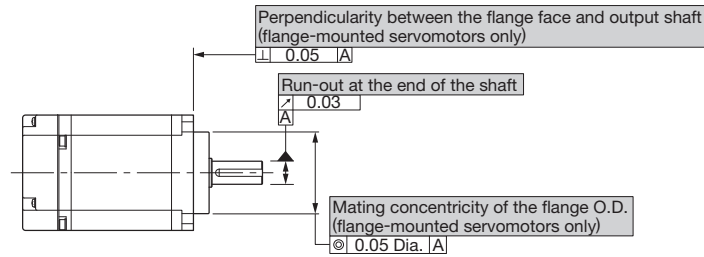
Observe the following precautions:

- When you connect the cables to the servomotor, connect the servomotor's main circuit cable first. If you connect the encoder cable first, the encoder may be damaged due to the difference in electrical potential from the FG.
- Make sure there is no foreign matters such as dust and metal chips in the connector before connecting.
- Do not apply shock to connectors. Otherwise, they may be damaged.
- Before you connect the wires, make sure that there are no mistakes in the wiring.
- Be sure not to apply stress on the connector. The connector may be damaged by stress.
- If you move the servomotor while the cables are connected, always hold onto the main body of the servomotor. If you lift the servomotor by the cables when you move it, the terminals may be damaged or the cables may be broken.

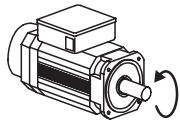
Mechanical Specifications

● Mechanical Tolerance T.I.R. (Total Indicator Reading)

The following figure shows tolerances for the servomotor's output shaft and installation area. For more details on tolerances, refer to the external dimensions of the individual servomotor.



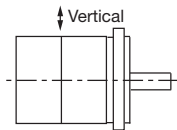
● Direction of Servomotor Rotation



Counterclockwise

Positive rotation of the servomotor is counterclockwise when viewed from the load. The direction of rotation can be reversed by changing the SERVOPACK parameters.

● Shock Resistance

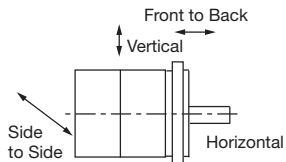


Impact Applied to the Servomotor

Mount the servomotor with the axis horizontal. The servomotor will withstand the following vertical impacts:

- Impact Acceleration: 490 m/s^2
- Impact occurrences: 2

● Vibration Resistance



Impact Applied to the Servomotor

Mount the servomotor with the axis horizontal. The servomotor will withstand the following vibration acceleration in three directions: Vertical, side to side, and front to back.

- Vibration Acceleration: 24.5 m/s^2

IMPORTANT

The amount of vibration the servomotor endures will vary depending on the application. Check the vibration acceleration being applied to your servomotor for each application.

● Vibration Class

The vibration class for the servomotors at rated motor speed is V15.

(A vibration class of V15 indicates a total vibration amplitude of $15 \text{ }\mu\text{m}$ maximum on the servomotor during rated rotation.)

Holding Brake Delay Time

Holding brakes have motion delay time that varies depending on when the brake is open and when the brake is operating. The following table shows the brake delay time of each servomotor.

IMPORTANT

Make sure the holding brake delay time is correct for your servomotor.

- Example, switching the holding brakes on the DC side

Main Circuit Power Supply Voltage	Servomotor Model SGMVV-	Rated Speed RPM	Voltage	Brake Open Time ms	Brake Operation Time ms	
Three-phase 200 VAC	2BA□B	1500	24 VDC or 90 VDC	500 max.	150 max.	
	3ZA□B					
	3GA□B					
	2BA□D	800		550 max.	320 max.	
	3ZA□D			700 max.	320 max.	
	3GA□D					
Three-phase 400 VAC	2BD□B	1500		24 VDC or 90 VDC	500 max.	150 max.
	3ZD□B					
	3GD□B					
	4ED□B	550 max.			320 max.	
	5ED□B	800			500 max.	150 max.
	2BD□D				550 max.	320 max.
	3ZD□D		700 max.	320 max.		
	3GD□D					
	4ED□D		*			

* : An SGMVV-4ED□D servomotor is not available in a model with a holding brake.