

## 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

Thermal Class: F

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

1800 VAC for one minute (400-V Class)

Enclosure: Totally enclosed, self-cooled, IP67

(except for shaft opening)

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

Drive Method: Direct drive

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

### 200 V Class

Servomotor Model: SGMGV- <i>IIII</i>		03A	05A	09A	13A	20A	30A	44A	55A	75A	1AA	1EA
Rated Output* <sup>1</sup>	kW	0.3	0.45	0.85	1.3	1.8	2.9	4.4	5.5	7.5	11	15
Rated Torque* <sup>1</sup>	N·m	1.96	2.86	5.39	8.34	11.5	18.6	28.4	35.0	48.0	70.0	95.4
Instantaneous Peak Torque* <sup>1</sup>	N·m	5.88	8.92	13.8	23.3	28.7	45.1	71.1	87.6	119	175	224
Rated Current* <sup>1</sup>	A <sub>rms</sub>	2.8	3.8	6.9	10.7	16.7	23.8	32.8	42.1	54.7	58.6	78
Instantaneous Max. Current* <sup>1</sup>	A <sub>rms</sub>	8	11	17	28	42	56	84	110	130	140	170
Rated Speed* <sup>1</sup>	min <sup>-1</sup>	1500										
Max. Speed* <sup>1</sup>	min <sup>-1</sup>	3000									2000	
Torque Constant	N·m/A <sub>rms</sub>	0.776	0.854	0.859	0.891	0.748	0.848	0.934	0.871	0.957	1.32	1.37
Rotor Moment of Inertia	×10 <sup>-4</sup> kg·m <sup>2</sup>	2.48 (2.73)	3.33 (3.58)	13.9 (16)	19.9 (22)	26 (28.1)	46 (54.5)	67.5 (76.0)	89.0 (97.5)	125 (134)	242 (261)	303 (341)
Rated Power Rate* <sup>1</sup>	kW/s	15.5 (14.1)	24.6 (22.8)	20.9 (18.2)	35.0 (31.6)	50.9 (47.1)	75.2 (63.5)	119 (106)	138 (126)	184 (172)	202 (188)	300 (283)
Rated Angular Acceleration* <sup>1</sup>	rad/s <sup>2</sup>	7900 (7180)	8590 (7990)	3880 (3370)	4190 (3790)	4420 (4090)	4040 (3410)	4210 (3740)	3930 (3590)	3840 (3580)	2890 (2680)	3150 (2960)
Applicable SERVOPACK	SGDV- <i>IIII</i>	3R8A	3R8A	7R6A	120A	180A	330A 200A <sup>*2</sup>	330A	470A	550A	590A	780A

\*1: These items and torque-motor speed characteristics quoted in combination with a SERVOPACK are at an armature winding temperature of 20°C.

\*2: Some restrictions apply when using an SGD V-200A SERVOPACK in combination with an SGMGV-30A servomotor.

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.

SGMGV-03A/-05A: 250 mm × 250 mm × 6 mm (aluminum)

SGMGV-09A/-13A/-20A: 400 mm × 400 mm × 20 mm (iron)

SGMGV-30A/-44A/-55A/-75A: 550 mm × 550 mm × 30 mm (iron)

SGMGV-1AA/-1EA: 650 mm × 650 mm × 35 mm (iron)

### 400 V Class

Servomotor Model: SGMGV- <i>IIII</i>		03D	05D	09D	13D	20D	30D	44D	55D	75D	1AD	1ED
Rated Output*	kW	0.3	0.45	0.85	1.3	1.8	2.9	4.4	5.5	7.5	11	15
Rated Torque*	N·m	1.96	2.86	5.39	8.34	11.5	18.6	28.4	35.0	48.0	70.0	95.4
Instantaneous Peak Torque*	N·m	5.88	8.92	13.8	23.3	28.7	45.1	71.1	87.6	119	175	224
Rated Current*	A <sub>rms</sub>	1.4	1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.7	28.1	37.2
Instantaneous Max. Current*	A <sub>rms</sub>	4	5.5	8.5	14	20	28	40.5	52	65	70	85
Rated Speed*	min <sup>-1</sup>	1500										
Max. Speed*	min <sup>-1</sup>	3000									2000	
Torque Constant	N·m/A <sub>rms</sub>	1.55	1.71	1.72	1.78	1.50	1.70	1.93	1.80	1.92	2.64	2.74
Rotor Moment of Inertia	×10 <sup>-4</sup> kg·m <sup>2</sup>	2.48 (2.73)	3.33 (3.58)	13.9 (16)	19.9 (22)	26 (28.1)	46 (54.5)	67.5 (76.0)	89.0 (97.5)	125 (134)	242 (261)	303 (341)
Rated Power Rate*	kW/s	15.5 (14.1)	24.6 (22.8)	20.9 (18.2)	35.0 (31.6)	50.9 (47.1)	75.2 (63.5)	119 (106)	138 (126)	184 (172)	202 (188)	300 (283)
Rated Angular Acceleration*	rad/s <sup>2</sup>	7900 (7180)	8590 (7990)	3880 (3370)	4190 (3790)	4420 (4090)	4040 (3410)	4210 (3740)	3930 (3590)	3840 (3580)	2890 (2680)	3150 (2960)
Applicable SERVOPACK	SGDV- <i>IIII</i>	1R9D	1R9D	3R5D	5R4D	8R4D	120D	170D	210D	260D	280D	370D

\*: 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.

SGMGV-03D/-05D: 250 mm × 250 mm × 6 mm (aluminum)

SGMGV-09D/-13D/-20D: 400 mm × 400 mm × 20 mm (iron)

SGMGV-30D/-44D/-55D/-75D: 550 mm × 550 mm × 30 mm (iron)

SGMGV-1AD/-1ED: 650 mm × 650 mm × 35 mm (iron)

# Features

- 1Unprecedented ease-of-use through cutting-edge technology
  - New tuning-less function means no adjustment needed.
  - Impressive load regulation with strengthened vibration suppression function.
- 1Slashed setup time
  - Setup wizard function and wiring conformation function of engineering tool SigmaWin+ allows easy setup just by watching the monitor.
- 1High response characteristics at 1 kHz min.
  - New advanced autotuning.
  - Reduced positioning time through model following control, and smooth machine control enabled by vibration suppression function.

## Ratings

### Single-phase 100 V

SERVOPACK Model	SGDV- <i>iiii</i>	R70F	R90F	2R1F	2R8F
Applicable Servomotor Max. Capacity	kW	0.05	0.1	0.2	0.4
Continuous Output Current	$A_{rms}$	0.66	0.91	2.1	2.8
Max. Output Current	$A_{rms}$	2.1	2.9	6.5	9.3
Main Circuit (Single Phase)		100 to 115 VAC+10% to -15% 50/60 Hz			
Control Circuit (Single Phase)		100 to 115 VAC+10% to -15% 50/60 Hz			

### Single-phase 200 V

SERVOPACK Model	SGDV- <i>iiii</i>	R70A	R90A	1R6A	2R8A	5R5A	120
Applicable Servomotor Max. Capacity	kW	0.05	0.1	0.2	0.4	0.75	1.5
Continuous Output Current	$A_{rms}$	0.66	0.91	1.6	2.8	5.5	11.6
Max. Output Current	$A_{rms}$	2.1	2.9	6.5	9.3	16.9	28
Main Circuit (Single Phase)		220 to 230 VAC+10% to -15% 50/60 Hz					
Control Circuit (Single Phase)		220 to 230 VAC+10% to -15% 50/60 Hz					

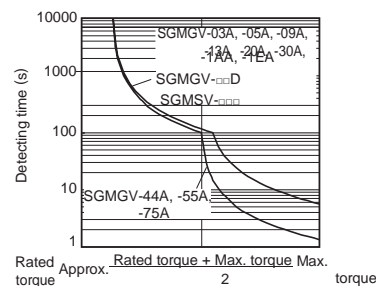
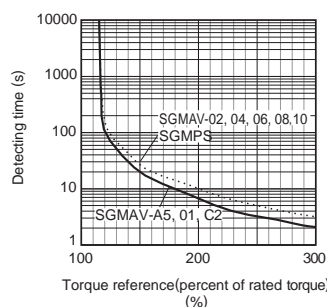
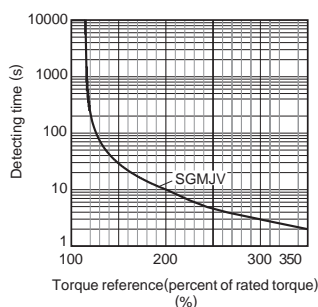
### Three-phase 200 V

SERVOPACK Model	SGDV- <i>iiii</i>	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A	470A	550A	590A	780A
Applicable Servomotor Max. Capacity	kW	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	6	7.5	11	15
Continuous Output Current	$A_{rms}$	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9	46.9	54.7	58.6	78
Max. Output Current	$A_{rms}$	2.1	2.9	6.5	9.3	11	16.9	17	28	42	56	84	110	130	140	170
Main Circuit		Three-phase 200 to 230 VAC+10% to -15% 50/60 Hz														
Control Circuit		Single-phase 200 to 230 VAC+10% to -15% 50/60 Hz														

### Three-phase 400 V

SERVOPACK Model	SGDV- <i>iiii</i>	1R9D	3R5D	5R4D	8R4D	120D	170D	210D	260D	280D	370D
Applicable Servomotor Max. Capacity	kW	0.5	1.0	1.5	2.0	3.0	5.0	6	7.5	11	15
Continuous Output Current	$A_{rms}$	1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.4	28.1	37.2
Max. Output Current	$A_{rms}$	5.5	8.5	14	20	28	42	55	65	70	85
Main Circuit		Three-phase 380 to 480 VAC+10% to -15% 50/60 Hz									
Control Circuit		24 VDC ±15%									

### 1SERVOPACK Overload Characteristics



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.

# Specifications

Items		Specifications	
Input Power Supply	Main Circuit	100 V	Single-phase 100 to 115 VAC + 10% to - 15% 50/60 Hz
		200 V	Three-phase 200 to 230 VAC + 10% to - 15% 50/60 Hz
		400 V	Three-phase 380 to 480 VAC + 10% to - 15% 50/60 Hz
	Control Circuit	100 V	Single-phase 100 to 115 VAC + 10% to - 15% 50/60 Hz
		200 V	Single-phase 200 to 230 VAC + 10% to - 15% 50/60 Hz
	400 V	24 VDC ± 15%	
Control Method		For 100 V, for 200 V, for 400 V, single-phase or three-phase full-wave rectification IGBT PWM control, sine-wave driven	
Feedback	Rotary Servomotors	Serial encoder: 13-bit (incremental encoder) : 17-bit (incremental/absolute encoder) : 20-bit (incremental/absolute encoder)	
	Linear Servomotors	Serial converter or serial data	
Operating Conditions	Surrounding/Storage Temperature	Surrounding temperature: 0 to + 55°C, storage temperature: - 20 to + 85°C	
	Ambient/Storage Humidity	90%RH or less (no condensation)	
	Vibration/Shock Resistance	Vibration resistance: 4.9 m/s <sup>2</sup> , Shock resistance: 19.6 m/s <sup>2</sup>	
	Protection class/Pollution degree	Protection class: IP 1X, pollution degree: 2 Do not use SERVOPACKs in the following locations: · Locations subject to corrosive or flammable gasses · Locations subject to exposure to water, oil, or chemicals · Locations subject to dust, including iron dust, and salts	
	Others	Do not use SERVOPACKs in the following locations: · Locations subject to static electricity noise, strong electromagnetic/magnetic fields, radioactivity	
	Elevation	1000 m or less	
Compliant Standards		UL 508C EN50178, EN55011 class A group 1, EN61800-3, EN61800-5-1	
Configuration		Base-mounted (Rack-mounting available as an option for some models. 6 kW or more models are duct-ventilated.)	
Performance	Speed Control Range	1:5000 (The lowest speed of the speed control range is the speed at which the servomotor will not stop with a rated torque load.)	
	Speed Regulation*	Load Regulation	0% to 100% load: ± 0.01% max. (at rated speed)
		Voltage Regulation	Rated voltage : ± 10% : 0% (at rated speed)
		Temperature Regulation	25 ± 25°C : ± 0.1% max. (at rated speed)
	Torque Control Tolerance (Repeatability)	± 1%	
Soft Start Time Setting	0 to 10 s (can be set individually for acceleration and deceleration.)		
I/O Signals	Encoder Output Pulses	Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available.	
Communications	RS-422A Communications	Interface	Digital operator, RS-422A port of personal computers etc.
		1:N communications	RS-422A port: N= 15 max. available
		Axis address setting	Set by parameters
	USB Communications	Interface	Personal computers (application: engineering tool SigmaWin+)
		1:N communications	Compliant with USB1.1 standard
	Function	Status display, parameter settings, adjustment functions, utility functions, parameter copy functions, waveform trace	
Display	Power Charge	CHARGE for main circuit power supply input confirmation One LED (orange)	
Analog Monitor		Analog monitor connector built in for monitoring speed, torque and other reference signals. Number of points: 2	
Protective Functions		Overcurrent, Overvoltage, low voltage, overload, regeneration error	
Utility Functions		Alarm history, JOG operation, origin search, etc.	
Regenerative Processing		100 VAC model: External regenerative resistor (optional) 200 VAC SGD V-R70A, -R90A, -1R6A, -2R8A: External regenerative resistor (optional) 200 VAC SGD V-470A, -550A, -590A, -780A: External regenerative resistor unit (optional) 200 VAC models other than shown above: Built-in regenerative resistor 400 VAC SGD V-210D, -260D, -280D, -370D: External regenerative resistor unit (optional) 400 VAC models other than shown above: Built-in regenerative resistor	
Safety Functions	Input	/HWBB1, /HWBB2: Hard wire base block signal	
	Output	EDM1: Status monitor (fixed output) of built-in safety circuit	
	Compliant Standards	EN954 category 3 Stop category 0, IEC61508 SIL 2	
Option Card Function	Feedback	Serial encoder communications input for fully-closed loop control	

\*: Speed regulation is defined as follows:

$$\text{Speed regulation} = \frac{\text{No-load motor speed} - \text{Total load motor speed}}{\text{Rated motor speed}} \times 100\%$$

The motor speed may change due to voltage variations or temperature variation. The ratio of speed changes to the rated speed represent speed regulation due to voltage and temperature variations.