

Features

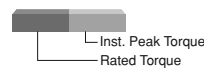
- Directly coupled to a load without a mechanical transmission such as a gear.
- Powerful and smooth operation throughout the speed range from low to high.
(Instantaneous peak torque: 6 to 600 N·m
maximum speed: 250 to 500 min⁻¹)
- High-resolution, 20-bit encoder for highly precise indexing.
- Easy wiring and piping with the hollow structure.

Application Examples

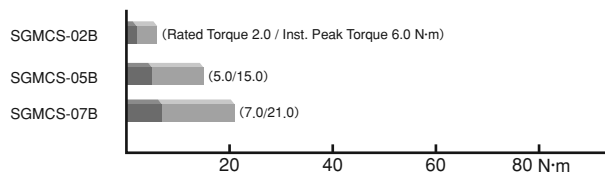
- Semiconductor equipment
- LCD manufacturing equipment
- Units for inspection and testing
- Electronic parts assembling machines
- IC handlers
- Inspection units for integrated circuits
- Automated machines
- Robots

Rated Torque / Peak Torque

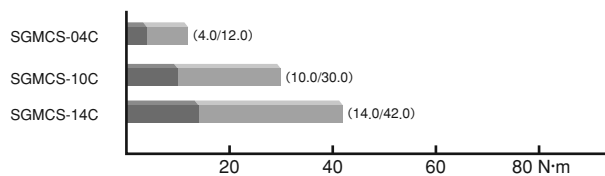
● Small-capacity



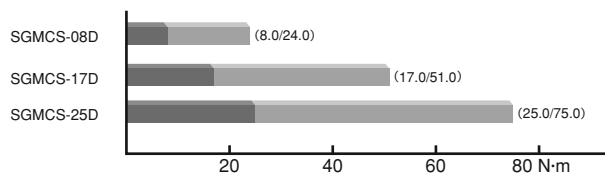
Outer Diameter 135 mm, Inner Diameter 20 mm



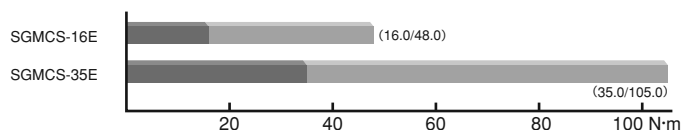
Outer Diameter 175 mm, Inner Diameter 35 mm



Outer Diameter 230 mm, Inner Diameter 60 mm



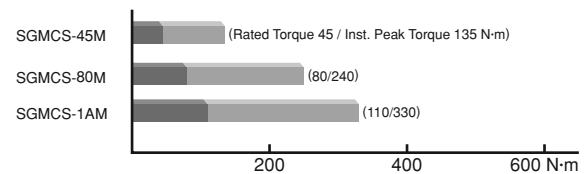
Outer Diameter 290 mm, Inner Diameter 75 mm



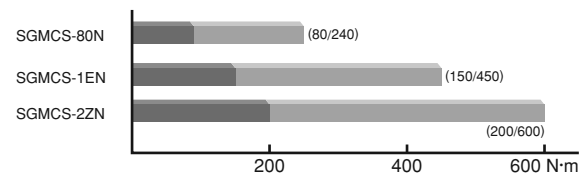
● Medium-capacity



Outer Diameter 280 mm, Inner Diameter 75 mm



Outer Diameter 360 mm, Inner Diameter 118 mm



Ratings and Specifications

● Small-capacity Series

Time Rating: Continuous

Vibration Class: V15

Insulation Resistance: 500 VDC, 10 MΩ min.

Ambient Temperature: 0 to 40°C

Excitation: Permanent magnet

Mounting: Flange method

Thermal Class: A

Withstand Voltage: 1500 VAC for one minute

Enclosure: Totally enclosed, self-cooled, IP42 (except for gaps on the rotating section of the shaft)

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

Voltage		200 V										
Servomotor Model SGMCS-□□□□□		02B□C	05B□C	07B□C	04C□C	10C□C	14C□C	08D□C	17D□C	25D□C	16E□B	35E□B
Rated Output ^{*1}	W	42	105	147	84	209	293	168	356	393	335	550
Rated Torque ^{*1, *2}	N·m	2.0	5.0	7.0	4.0	10.0	14.0	8.0	17.0	25.0	16.0	35.0
Instantaneous Peak Torque ^{*1}	N·m	6.0	15.0	21.0	12.0	30.0	42.0	24.0	51.0	75.0	48.0	105
Stall Torque ^{*1}	N·m	2.05	5.15	7.32	4.09	10.1	14.2	8.23	17.4	25.4	16.5	35.6
Rated Current ^{*1}	A _{rms}	1.8	1.7	1.4	2.2	2.2	2.8	1.9	2.5	2.6	3.3	3.5
Instantaneous Max. Current ^{*1}	A _{rms}	5.4	5.1	4.1	7.0	7.0	8.3	5.6	7.5	8.0	9.4	10.0
Rated Speed ^{*1}	min ⁻¹	200			200			200		150	200	150
Max. Speed ^{*1}	min ⁻¹	500			500	400	300	500	350	250	500	250
Torque Constant	N·m/A _{rms}	1.18	3.17	5.44	2.04	5.05	5.39	5.1	7.8	10.8	5.58	11.1
Rotor Moment of Inertia	×10 ⁻⁴ kg·m ²	28	51	77	77	140	220	285	510	750	930	1430
Rated Power Rate ^{*1}	kW/s	1.4	4.9	6.4	2.1	7.1	8.9	2.2	5.7	8.3	2.75	8.57
Rated Angular Acceleration ^{*1}	rad/s ²	710	980	910	520	710	640	280	330	330	170	240
Absolute Accuracy	second	±15			±15			±15		±15		
Repeatability	second	±1.3			±1.3			±1.3		±1.3		
Applicable SERVOPACK	SGDV-□□□□□	2R8A			2R8A			2R8A		5R5A		

*1: These items and torque-motor speed characteristics quoted in combination with an SGDV SERVOPACK are at an armature winding temperature of 100°C. Other values quoted at 20°C.

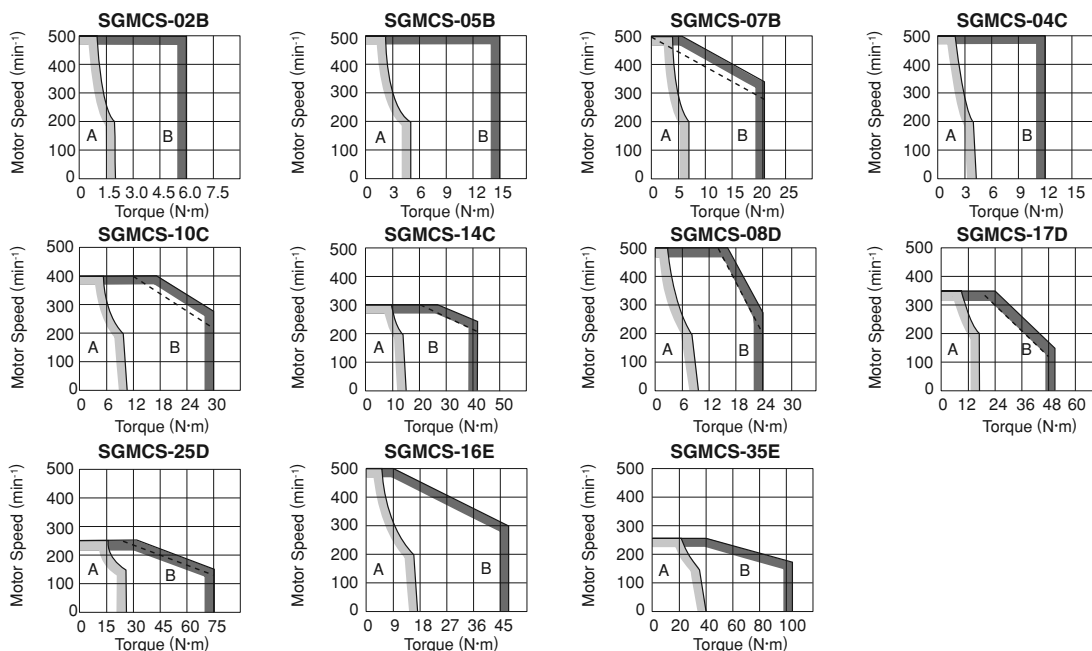
*2: Rated torques are continuous allowable torque values at 40°C with a steel heat sink attached.

Heat sink: SGMCS-□□B : 350 mm × 350 mm × 12 mm SGMCS-□□C : 450 mm × 450 mm × 12 mm
 SGMCS-□□D : 550 mm × 550 mm × 12 mm SGMCS-□□E : 650 mm × 650 mm × 12 mm

Notes: 1 SGMCS servomotor with holding brake is not available.

2 For the bearings used in SGMCS servomotors, loss varies according to the bearing temperature. At low temperatures, the amount of heat loss will be large.

● Small-capacity Series: Torque-Motor Speed Characteristics **A** : Continuous Duty Zone **B** : Intermittent Duty Zone^(Note2)



Notes: 1 The solid, dotted lines of the intermittent duty zone indicate the characteristics when a servomotor runs with the following combinations:

- The solid line: With a three-phase 200 V SERVOPACK
- The dotted line: With a single-phase 100 V SERVOPACK

2 When the effective torque during intermittent duty is within the rated torque, the servomotor can be used within the intermittent duty zone.

3 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.

Ratings and Specifications

● Medium-capacity Series

Time Rating: Continuous

Vibration Class: V15

Insulation Resistance: 500 VDC, 10 M Ω min.

Ambient Temperature: 0 to 40°C

Excitation: Permanent magnet

Mounting: Flange method

Thermal Class: F

Withstand Voltage: 1500 VAC for one minute

Enclosure: Totally enclosed, self-cooled, IP44

(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

Voltage		200 V					
Servomotor Model SGMCS-□□□□□		45M□□	80M□□	1AM□□	80N□□	1EN□□	2ZN□□
Rated Output ^{*1}	W	707	1260	1730	1260	2360	3140
Rated Torque ^{*1, *2}	N·m	45	80	110	80	150	200
Instantaneous Peak Torque ^{*1}	N·m	135	240	330	240	450	600
Stall Torque ^{*1}	N·m	45	80	110	80	150	200
Rated Current ^{*1}	A _{rms}	5.80	9.74	13.4	9.35	17.4	18.9
Instantaneous Max. Current ^{*1}	A _{rms}	17	28	42	28	56	56
Rated Speed ^{*1}	min ⁻¹	150					
Max. Speed ^{*1}	min ⁻¹	300			250		
Torque Constant	N·m/A _{rms}	8.39	8.91	8.45	9.08	9.05	11.5
Rotor Moment of Inertia	×10 ⁻⁴ kg·m ²	388	627	865	1360	2470	3060
Rated Power Rate ^{*1}	kW/s	52.2	102	140	47.1	91.1	131
Rated Angular Acceleration ^{*1}	rad/s ²	1160	1280	1270	588	607	654
Applicable SERVOPACK	SGDV-□□□□□	7R6A	120A	180A	120A	200A	200A

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

*2: Rated torques are continuous allowable torque values at 40°C with a steel heat sink attached.

Heat sink: 750 mm × 750 mm × 45 mm

Notes: 1 SGMCS servomotor with holding brake is not available.

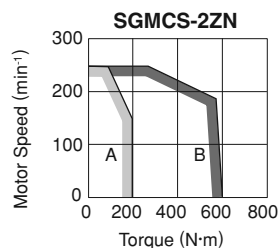
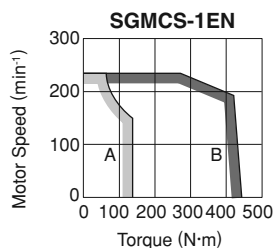
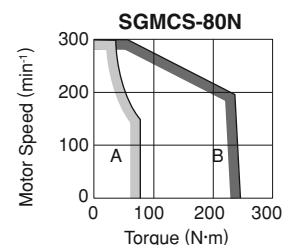
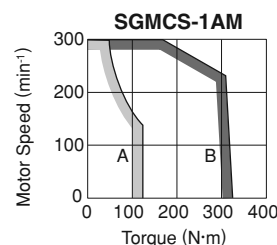
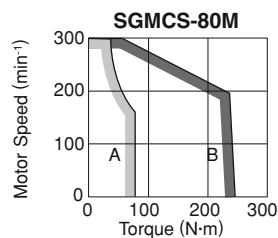
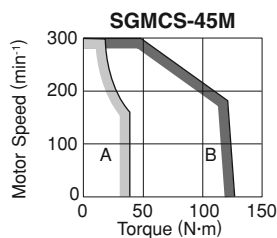
2 For the bearings used in SGMCS servomotors, loss varies according to the bearing temperature. At low temperatures, the amount of heat loss will be large.

● Medium-capacity Series: Torque-Motor Speed Characteristics

[A]

: Continuous Duty Zone

[B]

: Intermittent Duty Zone^(Note1)

Notes: 1 When the effective torque during intermittent duty 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.

Ratings and Specifications

● Allowable Load Moment of Inertia at the Motor Shaft

Servomotor Model		Rated Torque N·m	Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)
SGMCS-	02B□C, 05B□C, 07B□C, 04C□C	2.0, 5.0, 7.0, 4.0	10 times
	10C□C	10.0	5 times
	14C□C, 08D□C, 17D□C, 25D□C, 16E□B, 35E□B	14.0, 8.0, 17.0, 25.0, 16.0, 35.0	3 times
	45M□A, 80M□A, 1AM□A, 80N□A, 1EN□A, 2ZN□A	45, 80, 110, 150, 200	3 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 motor capacity and is limited to within 5 to 30 times the rotor moment of inertia of each servomotor (J_M). 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/>).

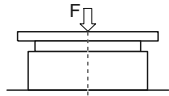
An overvoltage alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a regenerative overload alarm (A.320). Take one of the following steps if this occurs.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum speed.
- Install an external regenerative resistor if the alarm cannot be cleared using the steps above. Refer to Regenerative Resistors on page 293.

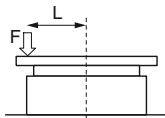
Mechanical Specifications

● **Allowable Loads**

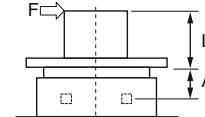
The loads applied while a servomotor is running are roughly classified in the following patterns. Design the machine so that the thrust load and moment load will not exceed the values in the table.



Where F is external force,
Thrust load: $F_a = F + \text{Load mass}$
Moment load: $M = 0$



Where F is external force,
Thrust load: $F_a = F + \text{Load mass}$
Moment load: $M = F \times L$



Where F is external force,
Thrust load: $F_a = \text{Load mass}$
Moment load: $M = F \times (L + A)$

(See the table below for the dimension A of each servomotor model.)

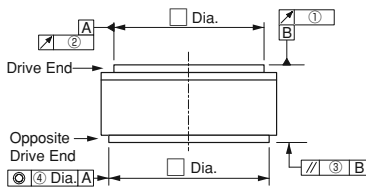
Servomotor Model SGMCS-□	02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E	45M	80M	1AM	80N	1EN	2ZN
Dimension A mm	0			0			0			0			33		37.5		
Allowable Thrust Load (Fa) N	1500			3300			4000			11000			9000		16000		
Allowable Moment Load (M) N·m	40	50	64	70	75	90	93	103	135	250	320	180		350			

Note: SGMCS-02B to -35E servomotors, set dimensions A to 0 (zero).

● **Mechanical Tolerance**

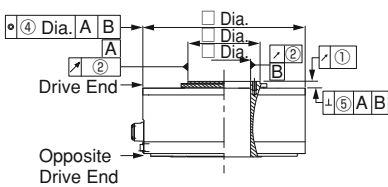
The following table shows tolerances for the servomotor's output shaft and installation area. See the dimensional drawing of the individual servomotor for more details on tolerances.

(1) Small-capacity Series



Tolerance T.I.R. (Total Indicator Reading) Units: mm	Servomotor Model SGMCS-										
	02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E
Run-out of the Surface of the Shaft	0.02		0.02		0.02		0.02		0.02		
Run-out at the End of the Shaft	0.04		0.04		0.04		0.04		0.04		
Perpendicularity between the Flange Face and Output Shaft	0.07		0.07		0.07		0.08		0.08		
Coaxiality of Output Axis and Mounting Socket Joint	0.07		0.07		0.07		0.08		0.08		

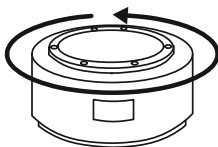
(2) Medium-capacity Series



Tolerance T.I.R. (Total Indicator Reading) Units: mm	Servomotor Model SGMCS-					
	45M	80M	1AM	80N	1EN	2ZN
Run-out of the Surface of the Shaft	0.02		0.02			
Run-out at the End of the Shaft	0.04		0.04			
Perpendicularity between the Flange Face and Output Shaft	-		-			
Coaxiality of Output Axis and Mounting Socket Joint	0.08		0.08			
Right angle between Flange Face and Output Shaft	0.08		0.08			

● **Direction of Rotation**

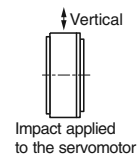
Positive rotation of the servomotor is counterclockwise when viewed from the load.



● **Impact Resistance**

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

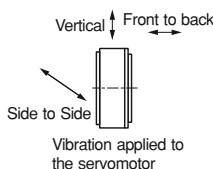
- Impact Acceleration: 490 m/s²
- Number of Impacts: 2



● **Vibration Resistance**

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.

Servomotor Type	Vibration Acceleration at Flange
Small-capacity Series	49 m/s ²
Medium-capacity Series	24.5 m/s ²



● **Vibration Class**

The vibration class at rated motor speed is V15. (A vibration class of V15 indicates a total vibration amplitude of 15 μm maximum on the servomotor during rated rotation.)

● **Enclosure**

Servomotor Type	Enclosure
Small-capacity Series	IP42 (except for gaps on the rotating section of the shaft)
Medium-capacity Series	IP44