

# SGM7D

## Model Designations

SGM7D - 30 F 7 C 4 1

Direct drive servomotors: SGM7D

1st+2nd digits

3rd digit

4th digit

5th digit

6th digit

7th digit

1st+2nd digits Rated Torque

Code	Specification	Code	Specification	Code	Specification
01	1.30 N·m	18	18.0 N·m	58	58.0 N·m
02	2.06 N·m	20	20.0 N·m	70	70.0 N·m
03	3.00 N·m	24	24.0 N·m	90	90.0 N·m
05	5.00 N·m	28	28.0 N·m	1Z	100 N·m
06	6.00 N·m	30	30.0 N·m	1A	110 N·m
08	8.00 N·m	34	34.0 N·m	1C	130 N·m
09	9.00 N·m	38	38.0 N·m	2B	220 N·m
12	12.0 N·m	45	45.0 N·m	2D	240 N·m

3rd digit Servomotor Outer Diameter

Code	Specification	Code	Specification
F	264-mm dia.	J	150-mm dia.
G	160-mm dia.	K	107-mm dia.
H	116-mm dia.	L	224 mm × 224 mm
I	264-mm dia.		

- Note: 1. Direct drive servomotors are not available with holding brakes.  
 2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

4th digit Serial Encoder

Code	Specification
7	24-bit multiturn absolute encoder*1
F	24-bit incremental encoder*1

\*1 The encoder can be used as a single-turn absolute encoder by setting a parameter.

5th digit Design Revision Order

C

6th digit Flange

Code	Mounting	Servomotor Outer Diameter Code (3rd Digit)						
		F	G	H	I	J	K	L
4	With cable on side	✓	✓	✓	-	-	-	✓
5	With cable on bottom	✓	✓*2	-	✓	✓	✓	-

✓: Applicable models.

\*2 SGM7D-01G and -05G are not available with a cable extending from the bottom.

7th digit Options

Code	Specification
1	Standard mechanical precision
2	High mechanical precision*3

\*3 The SGM7D-01G, -05G, and -03H are available only with high mechanical precision.

## Manufactured Models

Rated Torque N·m	Servomotor Outer Diameter						
	F (264-mm dia.)	G (160-mm dia.)	H (116-mm dia.)	I (264-mm dia.)	J (150-mm dia.)	K (107-mm dia.)	L (□224)
1.30	-	SGM7D-01G	-	-	-	-	-
2.06	-	-	-	-	-	SGM7D-02K	-
3.00	-	-	SGM7D-03H	-	-	-	-
5.00	-	SGM7D-05G	-	-	-	-	-
6.00	-	-	-	-	SGM7D-06J	SGM7D-06K	SGM7D-06L
8.00	-	SGM7D-08G	-	-	-	SGM7D-08K	-
9.00	-	-	-	-	SGM7D-09J	-	-
12.0	-	-	-	-	-	-	SGM7D-12L
18.0	-	SGM7D-18G	-	-	SGM7D-18J	-	-
20.0	-	-	-	-	SGM7D-20J	-	-
24.0	-	SGM7D-24G	-	-	-	-	-
28.0	-	-	-	SGM7D-28I	-	-	-
30.0	SGM7D-30F	-	-	-	-	-	SGM7D-30L

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Rated Torque N·m	Servomotor Outer Diameter						
	F (264-mm dia.)	G (160-mm dia.)	H (116-mm dia.)	I (264-mm dia.)	J (150-mm dia.)	K (107-mm dia.)	L (□224)
34.0	-	SGM7D-34G	-	-	-	-	-
38.0	-	-	-	-	SGM7D-38J	-	-
45.0	-	SGM7D-45G	-	-	-	-	-
58.0	SGM7D-58F	-	-	-	-	-	-
70.0	-	-	-	SGM7D-70I	-	-	-
90.0	SGM7D-90F	-	-	-	-	-	-
100	-	-	-	SGM7D-1ZI	-	-	-
110	SGM7D-1AF	-	-	-	-	-	-
130	-	-	-	SGM7D-1CI	-	-	-
220	-	-	-	SGM7D-2BI	-	-	-
240	-	-	-	SGM7D-2DI	-	-	-

**Note:**

The above table shows combinations of the rated torque and outer diameter. The fourth through seventh digits have been omitted.

## Specifications and Ratings

### Specifications

■ SGM7D-□□F, -□□G, -□□H

Voltage	200 V											
	Model: SGM7D-											
	30F	58F	90F	1AF	01G	05G	08G	18G	24G	34G	45G	03H
Time Rating	Continuous											
Thermal Class	F											
Insulation Resistance	500 VDC, 10 MΩ min.											
Withstand Voltage	1500 VAC for 1 minute											
Excitation	Three-phase											
Mounting	Flange-mounted											
Drive Method	Direct drive											
Rotation Direction	Counterclockwise (CCW) for forward reference when viewed from the load side											
Absolute Accuracy	±15 s											
Repeatability	±1.3 s											
Protective Structure <sup>*/</sup>	Totally enclosed, self-cooled, IP20				Totally enclosed, self-cooled, IP30		Totally enclosed, self-cooled, IP20				Totally enclosed, self-cooled, IP30	

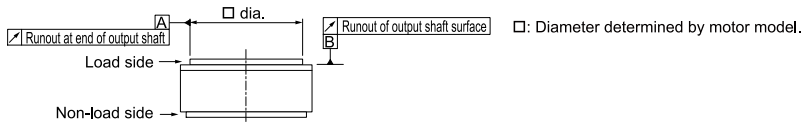
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Voltage			200 V											
Model: SGM7D-			30F	58F	90F	1AF	01G	05G	08G	18G	24G	34G	45G	03H
Environmental Conditions	Surrounding Air Temperature		0°C to 40°C (with no freezing)											
	Surrounding Air Humidity		20% to 80% relative humidity (with 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 1000 m or less. 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)											
Mechanical Tolerances *2	Runout of Output Shaft Surface/Runout at End of Output Shaft	Standard Mechanical Precision	mm	0.1			-		0.1		0.1		-	
		High Mechanical Precision	mm	0.005			0.01		0.005		0.01			
Applicable SERVO-PACKs	SGDXS-		120A			2R8A		120A			2R8A			
	SGDXW-		-											

\*1 Protective structure specifications apply only when the special cable is used.

\*2 Refer to the following figure for the relevant locations on the servomotor. Refer to the dimensional drawings of the individual servomotors for more information on tolerances.



### ■ SGM7D-□□I, -□□J

Voltage		200 V										
Model: SGM7D-		28I	70I	1ZI	1CI	2BI	2DI	06J	09J	18J	20J	38J
Time Rating		Continuous										
Thermal Class		F										
Insulation Resistance		500 VDC, 10 MΩ min.										
Withstand Voltage		1500 VAC for 1 minute										
Excitation		Three-phase										
Mounting		Flange-mounted										
Drive Method		Direct drive										
Rotation Direction		Counterclockwise (CCW) for forward reference when viewed from the load side										
Absolute Accuracy		±15 s										
Repeatability		±1.3 s										
Protective Structure *1		Totally enclosed, self-cooled, IP30										

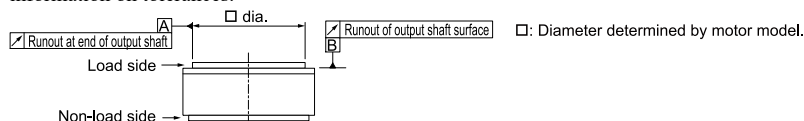
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Voltage			200 V										
Model: SGM7D-			28I	70I	1ZI	1CI	2BI	2DI	06J	09J	18J	20J	38J
Environmental Conditions	Surrounding Air Temperature		0°C to 40°C (with no freezing)										
	Surrounding Air Humidity		20% to 80% relative humidity (with no condensation)										
	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 1000 m or less. 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)										
Mechanical Tolerances *2	Runout of Output Shaft Surface/Runout at End of Output Shaft	Standard Mechanical Precision	mm	0.1									
		High Mechanical Precision	mm	0.005	0.02			0.005		0.01			
Applicable SERVOPACKs		SGDXS-	120A										
		SGDXW-	-										

\*1 Protective structure specifications apply only when the special cable is used.

\*2 Refer to the following figure for the relevant locations on the servomotor. Refer to the dimensional drawings of the individual servomotors for more information on tolerances.



## ■ SGM7D-□□K, -□□L

Voltage		200 V					
Model: SGM7D-		02K	06K	08K	06L	12L	30L
Time Rating	Continuous						
Thermal Class	F						
Insulation Resistance	500 VDC, 10 MΩ min.						
Withstand Voltage	1500 VAC for 1 minute						
Excitation	Three-phase						
Mounting	Flange-mounted						
Drive Method	Direct drive						
Rotation Direction	Counterclockwise (CCW) for forward reference when viewed from the load side						
Absolute Accuracy	±15 s						
Repeatability	±1.3 s						
Protective Structure *1	Totally enclosed, self-cooled, IP30						

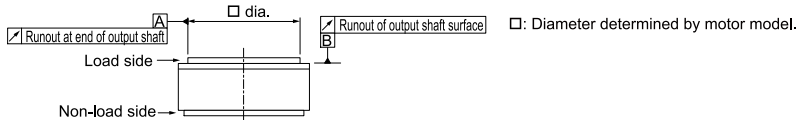
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Voltage		200 V					
Model: SGM7D-		02K	06K	08K	06L	12L	30L
Environmental Conditions	Surrounding Air Temperature	0°C to 40°C (with no freezing)					
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)					
	Installation Site	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 1000 m or less. 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)					
Mechanical Tolerances *2	Runout of Output Shaft Surface/ Runout at End of Output Shaft	Standard Mechanical Precision	mm	0.1		0.05	
		High Mechanical Precision	mm	0.01		0.005	
Applicable SERVOPACKs		SGDXS-	2R8A				120A
		SGDXW-	-				

\*1 Protective structure specifications apply only when the special cable is used.

\*2 Refer to the following figure for the relevant locations on the servomotor. Refer to the dimensional drawings of the individual servomotors for more information on tolerances.



## Ratings

### ■ SGM7D-□□F, -□□G, -□□H

Voltage		200 V											
Model: SGM7D-		30F	58F	90F	1AF	01G	05G	08G	18G	24G	34G	45G	03H
Rated Output	W	188	364	565	691	16	63	101	226	302	320	565	38
Rated Torque *1	N·m	30.0	58.0	90.0	110	1.30	5.00	8.00	18.0	24.0	34.0	45.0	3.00
Repetitive Rated Torque *2	N·m	-	-	-	-	-	-	-	-	27.0	40.0	52.0	-
Instantaneous Maximum Torque	N·m	50.0	100	150	200	4.00	6.00	15.0	30.0	45.0	60.0	75.0	4.00
Stall Torque	N·m	30.0	58.0	90.0	110	1.30	5.00	8.00	18.0	24.0	34.0	45.0	3.00
Rated Current	Arms	5.7	6.4	5.9	5.0	1.7	1.6	3.4	3.4	3.1	3.3	4.8	1.1
Instantaneous Maximum Current	Arms	14.1				4.2	3.5	10.6				3.5	
Rated Rotation Speed	min <sup>-1</sup>	60				120				90	120	120	
Maximum Rotation Speed	min <sup>-1</sup>	72				150		144				150	
Torque Constant	N·m/Arms	6.25	12.5	17.8	24.5	1.09	3.84	2.82	5.76	8.57	11.2	10.2	3.01
Rotor Moment of Inertia	×10 <sup>-4</sup> kg·m <sup>2</sup>	960	1190	1420	1670	55.0	75.0	120	150	190	230	270	25.0
Rated Power Rate	kW/s	9.38	28.3	57.0	72.5	0.307	3.33	5.33	21.6	30.3	50.3	75.0	3.60

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Voltage		200 V											
Model: SGM7D-		30F	58F	90F	1AF	01G	05G	08G	18G	24G	34G	45G	03H
Rated Angular Acceleration	rad/s <sup>2</sup>	313	487	634	659	236	667	667	1200	1260	1480	1670	1200
Heat Sink Size	mm	550 × 550 × 30 (aluminum)											350 × 350 × 20 (steel)
Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)	times	200	150	150	130	130	300	400	350	300	250	200	600
	With external regenerative resistor	times	2500	3500	4000	5000	130	300	2000	3000	4000	4000	600
Allowable Load *3	Allowable Thrust Load	Forward	N			4 × 10 <sup>4</sup>		50	200	3 × 10 <sup>4</sup>			50
		Reverse	N			2 × 10 <sup>4</sup>		50	200	1 × 10 <sup>4</sup>			50
	Allowable Moment Load	N·m	400			-	50	200			-		
Rigidity	Thrust Displacement Rigidity	Forward	mm/N			2 × 10 <sup>-6</sup>		-	2.5 × 10 <sup>-6</sup>			-	
		Reverse	mm/N			3 × 10 <sup>-6</sup>		-	3 × 10 <sup>-6</sup>			-	
	Moment Displacement Rigidity	rad/N·m	4 × 10 <sup>-7</sup>			-	1 × 10 <sup>-6</sup>			-			

\*1 The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a heat sink of the dimensions given in the table.

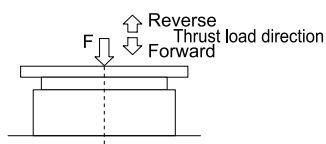
\*2 The repetitive rated torque is the value for 60% ED.

\*3 The thrust loads and moment loads that are applied while a servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.

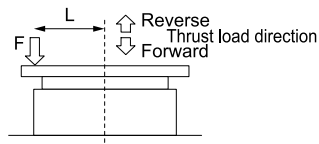
The allowable load is for a static load in one direction.

When designing the system, multiply the allowable load by the following safety coefficient depending on the type of load.

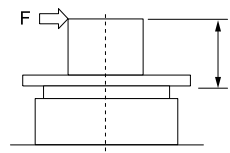
- Smooth load with no shock: 1/3
- Light repetitive load: 1/5
- Shock load: 1/10



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = 0



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = F × L



Where F is the external force,  
Thrust load = Load mass  
Moment load = F × L

**Note:**

1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.
2. For the bearings used in these servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

■ SGM7D-□□I, -□□J

Voltage		200 V										
Model: SGM7D-		28I	70I	1ZI	1CI	2BI	2DI	06J	09J	18J	20J	38J
Rated Output	W	264	440	628	817	691	754	75	113	226	251	358
Rated Torque *1	N·m	28.0	70.0	100	130	220	240	6.00	9.00	18.0	20.0	38.0
Instantaneous Maximum Torque	N·m	50.0	100	150	200	300	400	8.00	15.0	30.0	45.0	60.0
Stall Torque	N·m	28.0	70.0	100	130	220	240	6.00	9.00	18.0	20.0	38.0

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Voltage		200 V											
Model: SGM7D-		28I	70I	1ZI	1CI	2BI	2DI	06J	09J	18J	20J	38J	
Rated Current	Arms	5.2	5.6	5.5	5.0	5.6	4.8	4.0	3.4	3.0	2.2	3.1	
Instantaneous Maximum Current	Arms	14.1						10.6					
Rated Rotation Speed	min <sup>-1</sup>	90	60			30		120				90	
Maximum Rotation Speed	min <sup>-1</sup>	108	72			60	48	144					
Torque Constant	N·m/Arms	6.90	13.9	20.8	27.8	41.5	54.4	1.71	3.29	6.62	9.88	13.3	
Rotor Moment of Inertia	×10 <sup>-4</sup> kg·m <sup>2</sup>	1800	2000	2300	2850	3400	4000	150	210	240	260	330	
Rated Power Rate	kW/s	4.36	24.5	43.5	59.3	142	144	2.40	3.86	13.5	15.4	43.8	
Rated Angular Acceleration	rad/s <sup>2</sup>	156	350	435	456	647	600	400	429	750	769	1150	
Heat Sink Size	mm	550 × 550 × 30											
Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)	times	50	100	90	80	100	150	350	250	240	220	180	
	With external regenerative resistor and dynamic brake resistor	times	800	2000	2500	3000	100	150	700	900	2500	2000	
Allowable Load *2	Allowable Thrust Load	Forward	N						4 × 10 <sup>4</sup>				
		Reverse	N						2 × 10 <sup>4</sup>				
	Allowable Moment Load	N·m						400					
Rigidity	Thrust Displacement Rigidity	Forward	mm/N						2 × 10 <sup>-6</sup>				
		Reverse	mm/N						3 × 10 <sup>-6</sup>				
	Moment Displacement Rigidity	rad/N·m						4 × 10 <sup>-7</sup>					

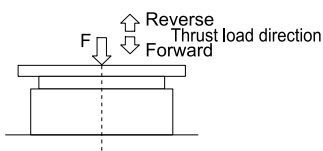
\*1 The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with an aluminum heat sink of the dimensions given in the table.

\*2 The thrust loads and moment loads that are applied while a servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.

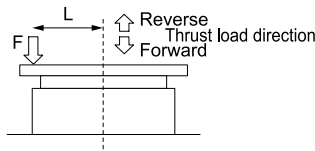
The allowable load is for a static load in one direction.

When designing the system, multiply the allowable load by the following safety coefficient depending on the type of load.

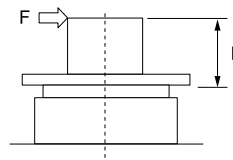
- Smooth load with no shock: 1/3
- Light repetitive load: 1/5
- Shock load: 1/10



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = 0



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = F × L



Where F is the external force,  
Thrust load = Load mass  
Moment load = F × L

**Note:**

1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.
2. For the bearings used in these servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

■ SGM7D-□□K, -□□L

Voltage		200 V						
Model: SGM7D-		02K	06K	08K	06L	12L	30L	
Rated Output	W	52	151	201	113	226	565	
Rated Torque *1	N·m	2.06	6.00	8.00	6.00	12.0	30.0	
Repetitive Rated Torque *2	N·m	-	6.90	-	-	-	-	
Instantaneous Maximum Torque	N·m	5.00	10.0	15.0	10.0	20.0	40.0	
Stall Torque	N·m	2.06	6.00	8.00	6.00	12.0	30.0	
Rated Current	Arms	1.6	1.8	1.6	1.7	2.1	8.1	
Instantaneous Maximum Current	Arms	4.2			4.2	4.2	14.1	
Rated Rotation Speed	min <sup>-1</sup>	240			180			
Maximum Rotation Speed	min <sup>-1</sup>	360			216			
Torque Constant	N·m/Arms	1.83	3.67	5.50	4.13	6.59	3.95	
Rotor Moment of Inertia	×10 <sup>-4</sup> kg·m <sup>2</sup>	60.0	70.0	80.0	220	220	370	
Rated Power Rate	kW/s	0.707	5.14	8.00	1.64	6.55	24.3	
Rated Angular Acceleration	rad/s <sup>2</sup>	343	857	1000	273	545	811	
Heat Sink Size	mm	550 × 550 × 30			650 × 650 × 30			
Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)	times	200	350	25	450	20	60	
	With external regenerative resistor	200	350	25	450	20	3500	
Allowable Load *3	Allowable Thrust Load	Forward	N			5 × 10 <sup>3</sup>		2000
		Reverse	N			3 × 10 <sup>3</sup>		1000
	Allowable Moment Load	N·m			20		100	
Rigidity	Thrust Displacement Rigidity	Forward	mm/N			4 × 10 <sup>-6</sup>		-
		Reverse	mm/N			8 × 10 <sup>-6</sup>		-
	Moment Displacement Rigidity	rad/N·m			8 × 10 <sup>-6</sup>		-	

\*1 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.

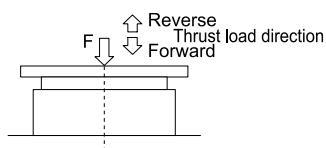
\*2 The repetitive rated torque is the value for 60% ED.

\*3 The thrust loads and moment loads that are applied while a servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.

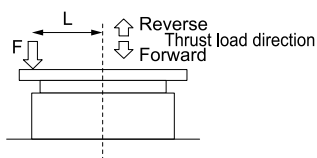
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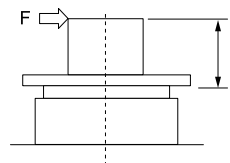
- Smooth load with no shock: 1/3
- Light repetitive load: 1/5
- Shock load: 1/10



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = 0



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = F × L



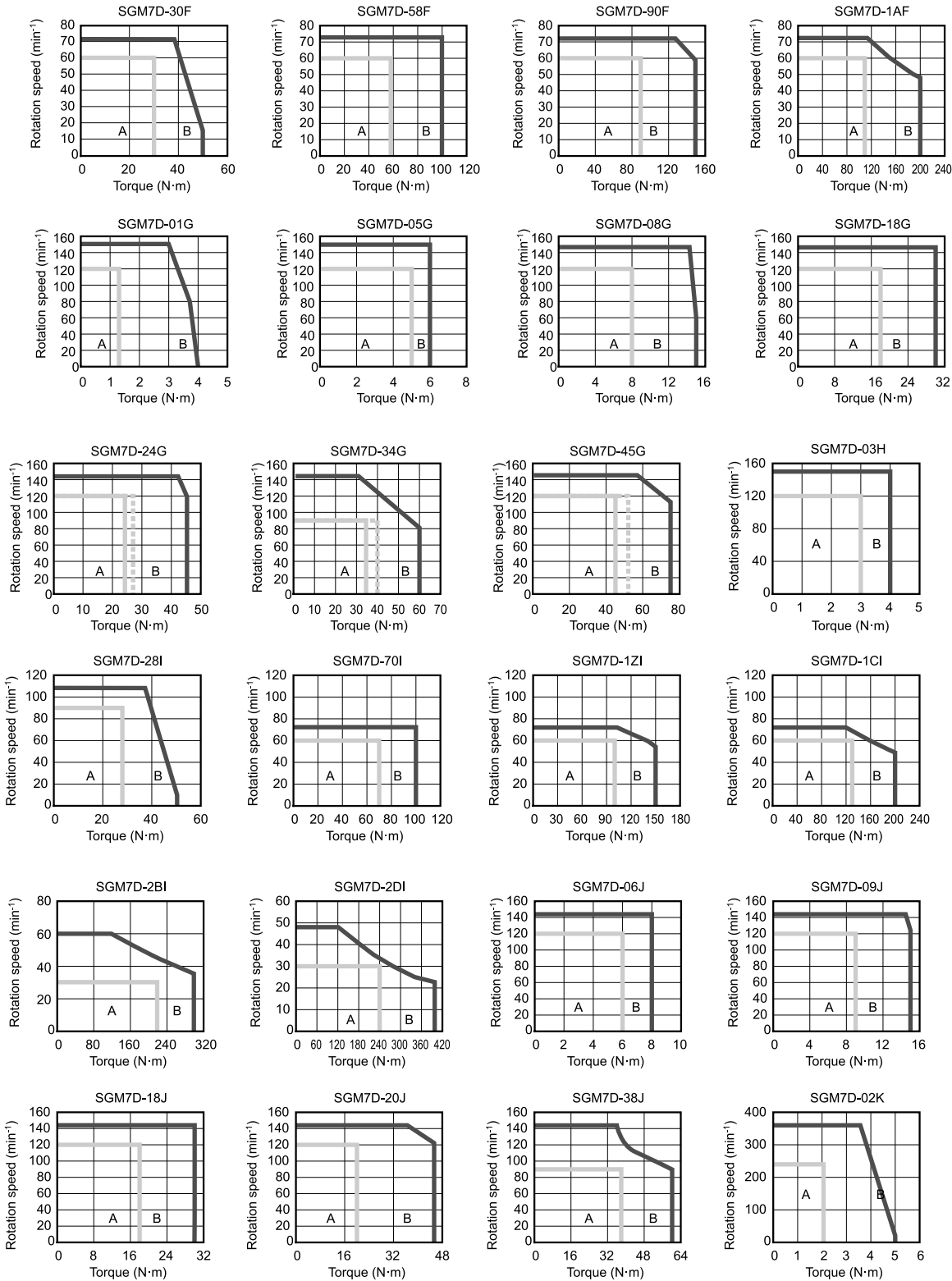
Where F is the external force,  
Thrust load = Load mass  
Moment load = F × L

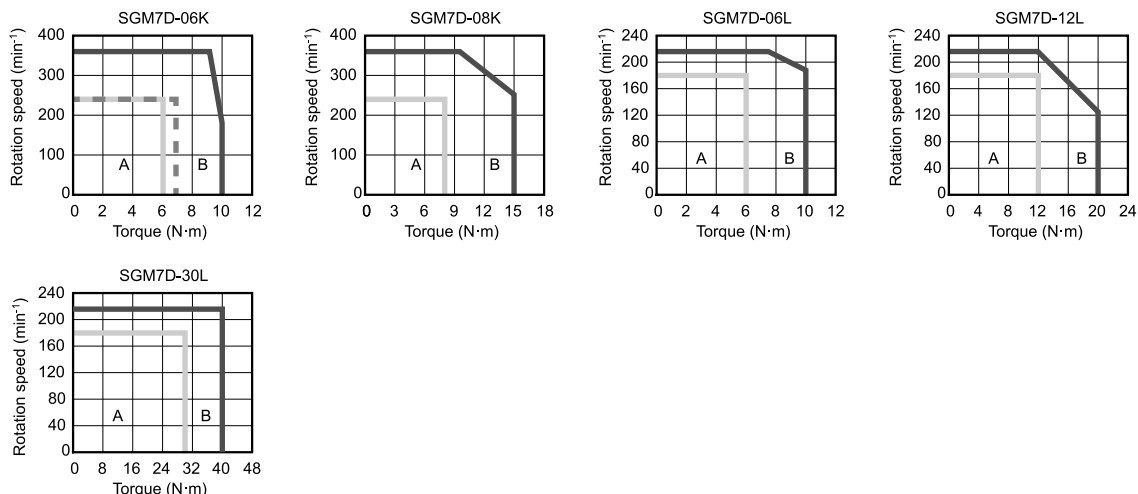
**Note:**

1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.
2. For the bearings used in these servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

## Torque-Motor Speed Characteristics

**A** : Continuous duty zone    - - - - - (dotted lines): With duty factor of 60% ED and 10-min rating  
**B** : Intermittent duty zone\*1    ——— (solid lines): With three-phase 200-V input or single-phase 200-V input





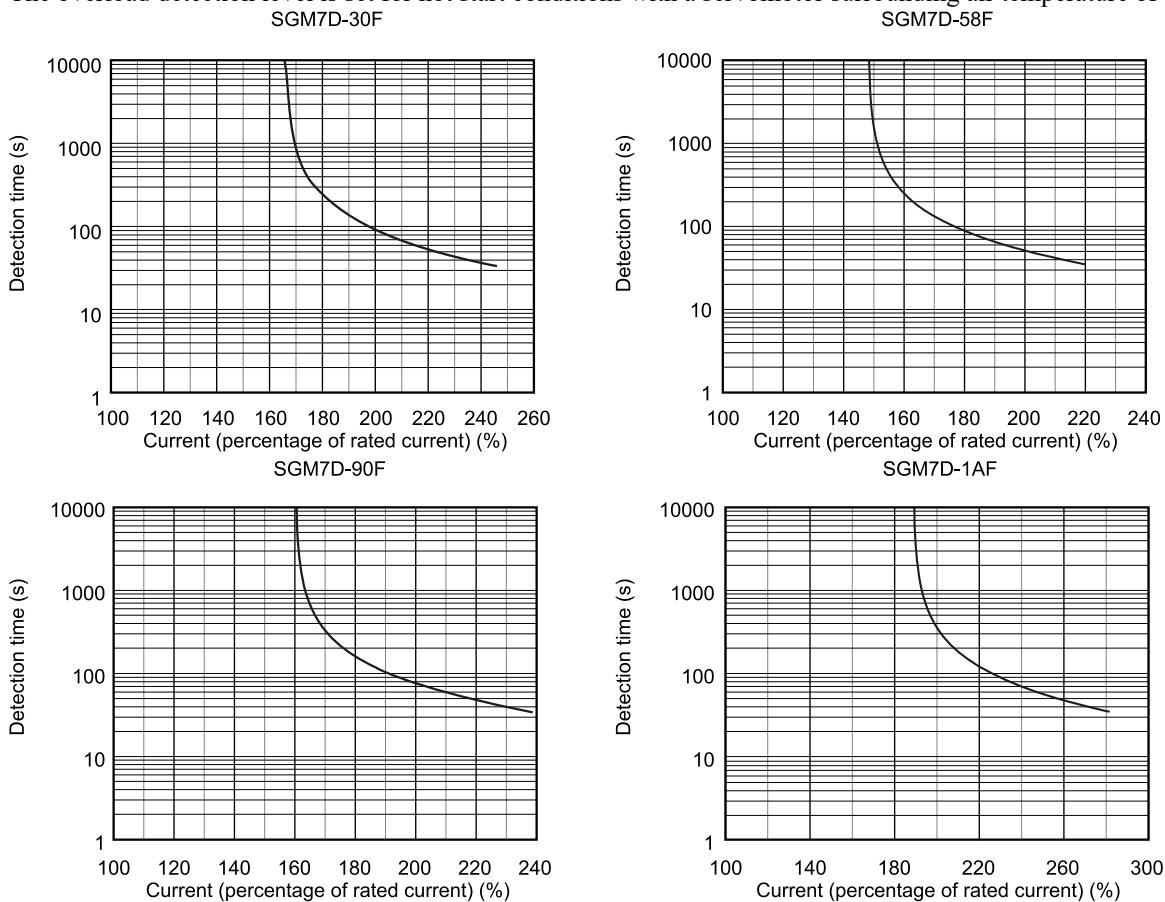
\*1 The characteristics are the same for a three-phase 200-VAC input and single-phase 200-VAC input.

**Note:**

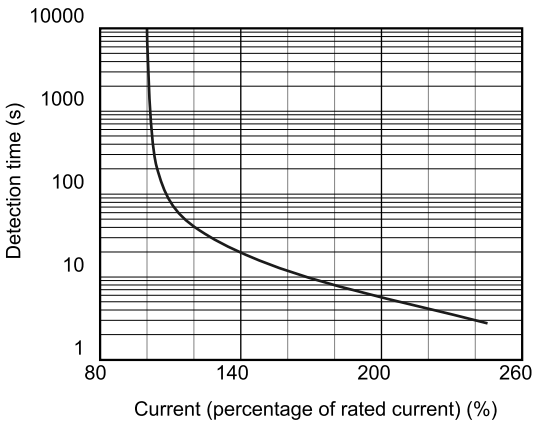
1. These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.
2. The characteristics in the intermittent duty zone depend on the power supply voltage.
3. If the effective torque is within the allowable range for the rated 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

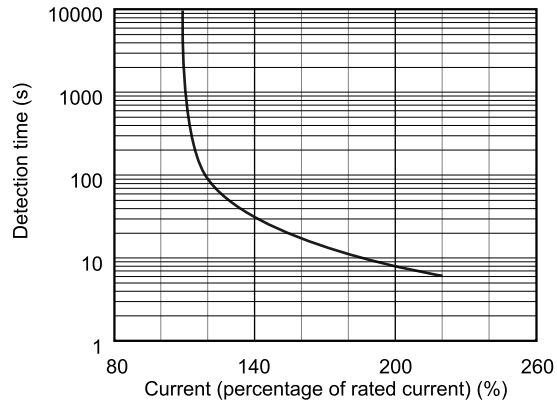
The overload detection level is set for hot start conditions with a servomotor surrounding air temperature of 40°C.



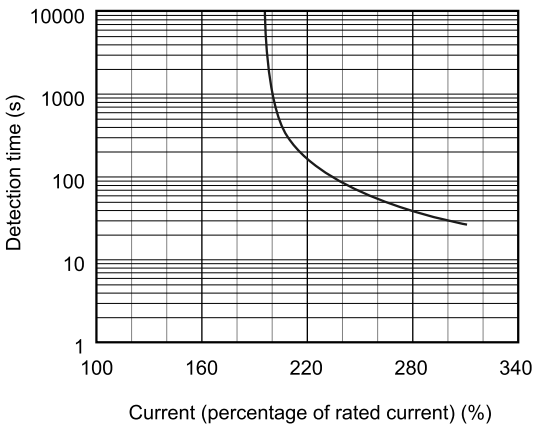
SGM7D-01G



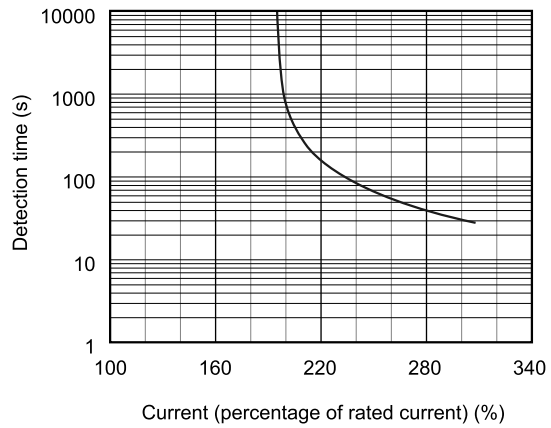
SGM7D-05G



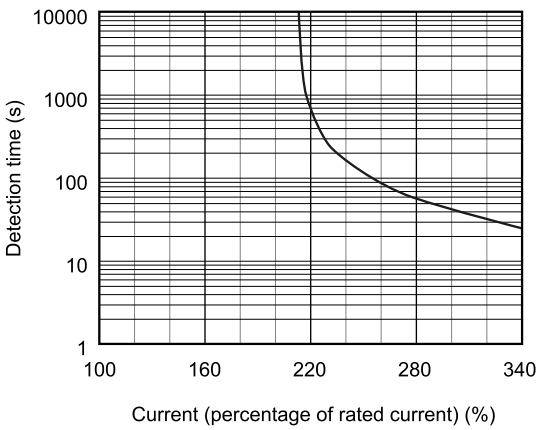
SGM7D-08G



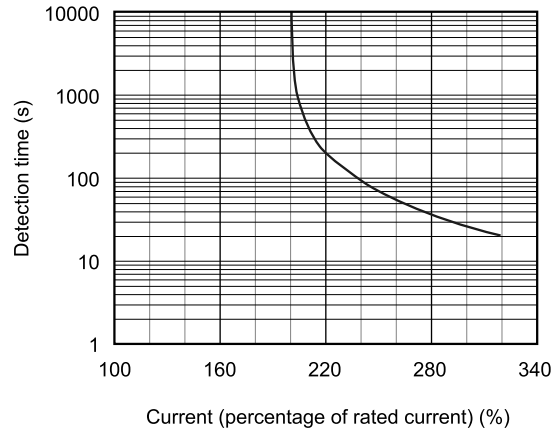
SGM7D-18G



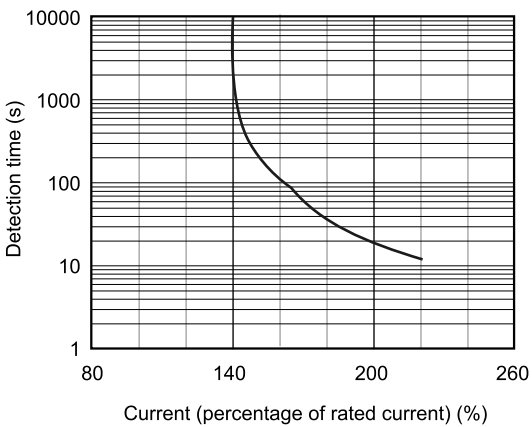
SGM7D-24G



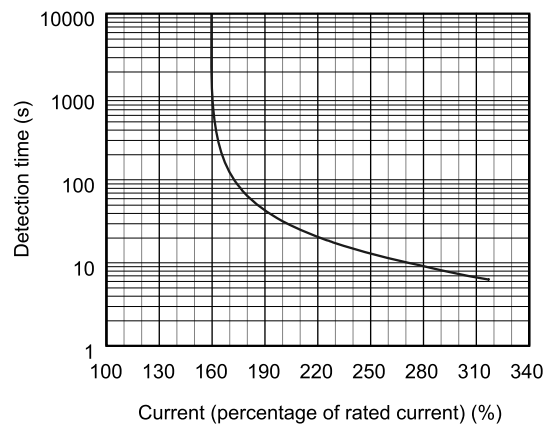
SGM7D-34G



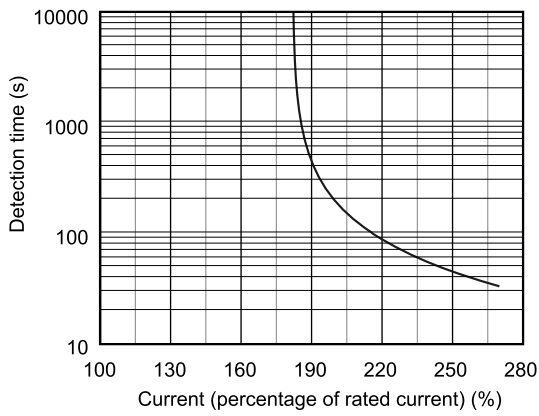
SGM7D-45G



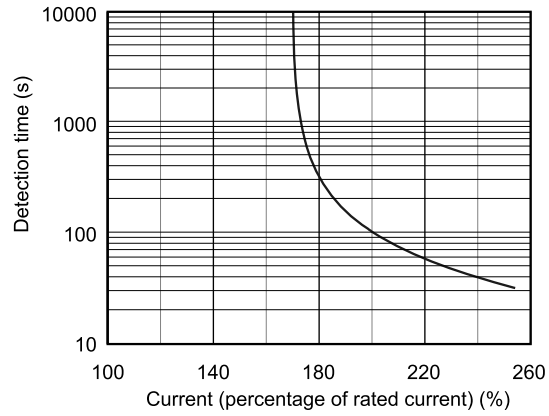
SGM7D-03H



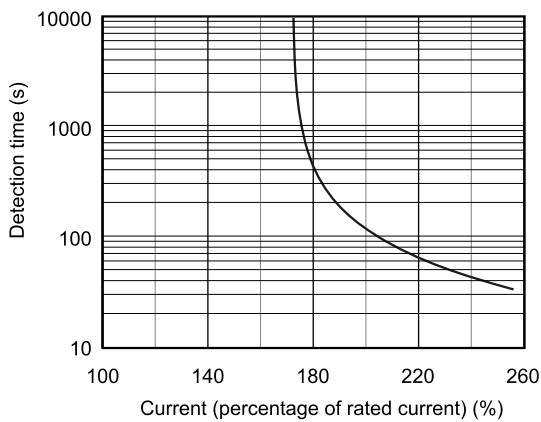
SGM7D-28I



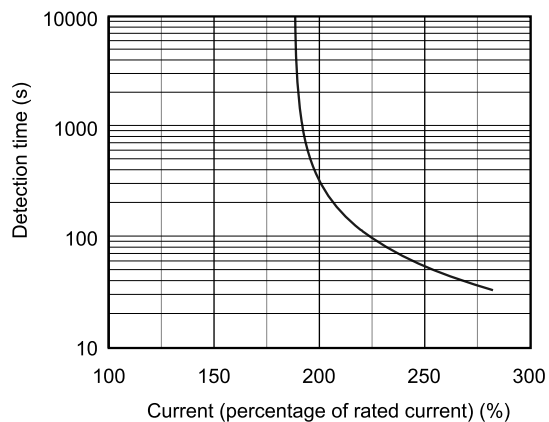
SGM7D-70I



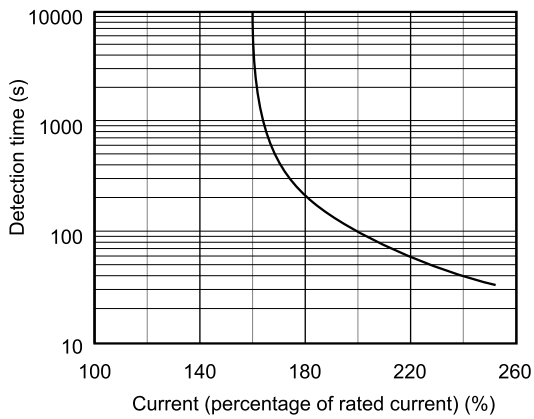
SGM7D-1ZI



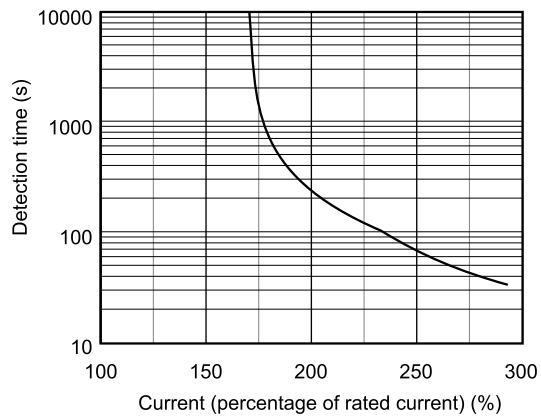
SGM7D-1CI



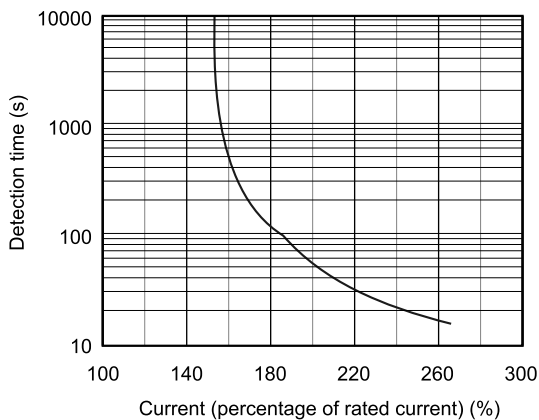
SGM7D-2BI



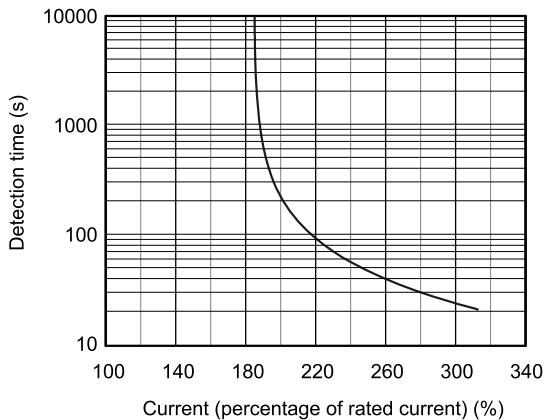
SGM7D-2DI



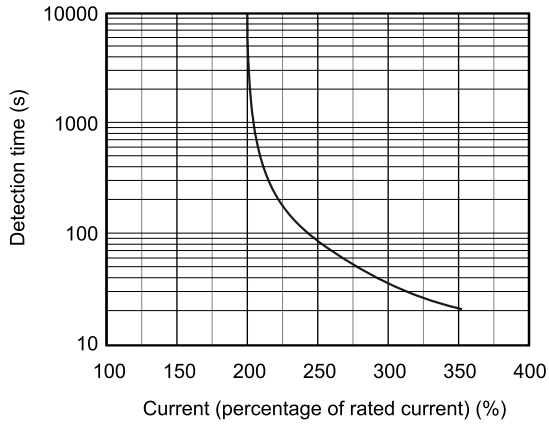
SGM7D-06J



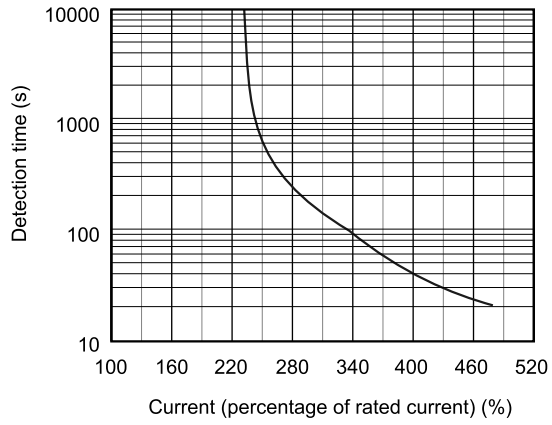
SGM7D-09J



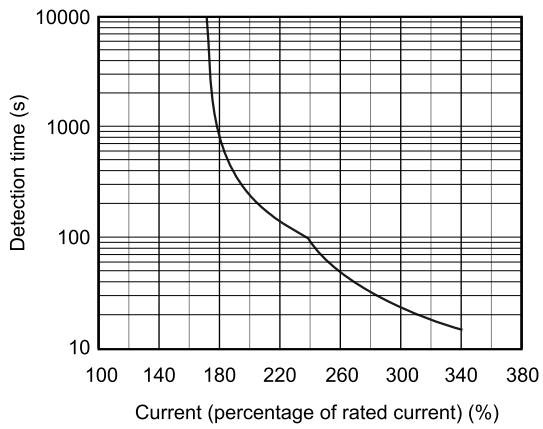
SGM7D-18J



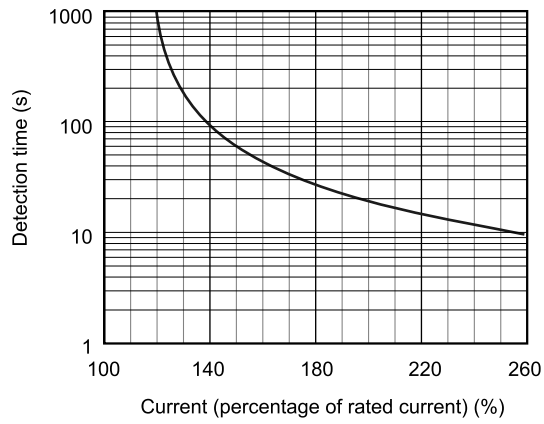
SGM7D-20J



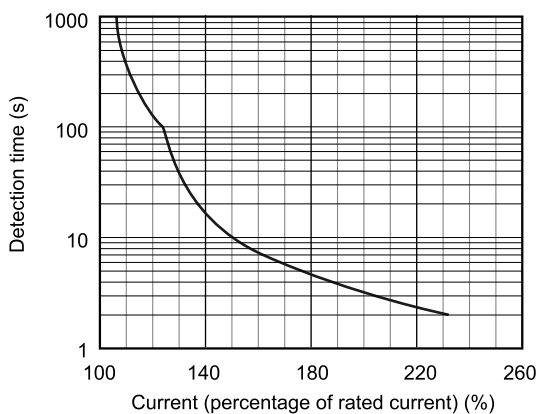
SGM7D-38J



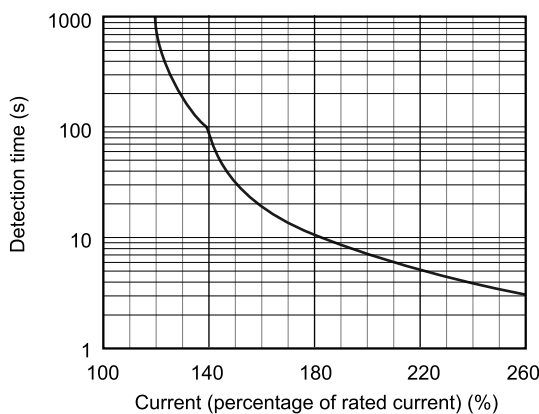
SGM7D-02K



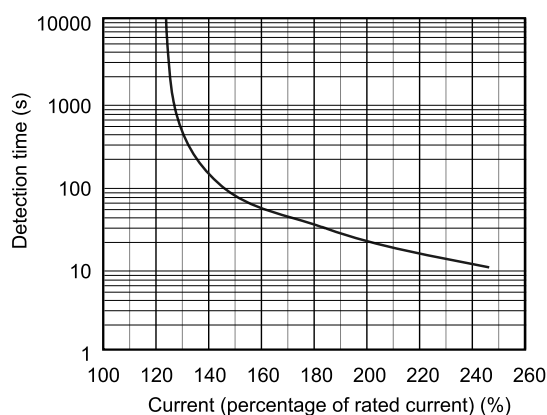
SGM7D-06K



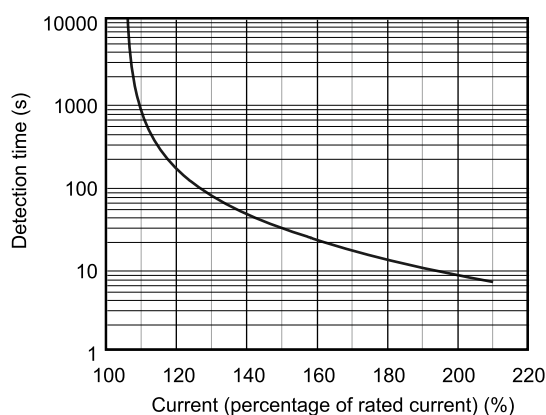
SGM7D-08K



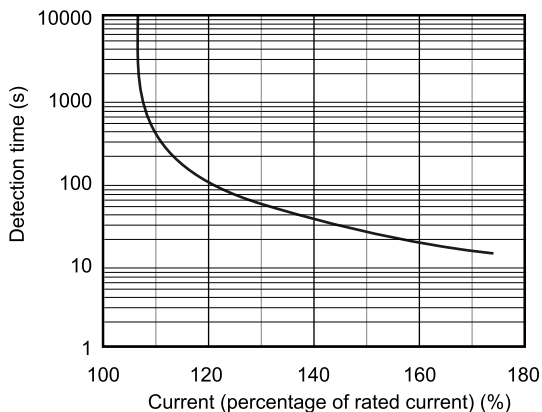
SGM7D-06L



SGM7D-12L



SGM7D-30L



**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. Refer to the following section for details on the effective torque.

 [Torque-Motor Speed Characteristics on page 226](#)

## Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the servomotors are given in "[Ratings on page 222](#)". 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 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). Install an external regenerative resistor when the built-in regenerative resistor cannot process all of the regenerative power.

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](#)

## ■ 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+.

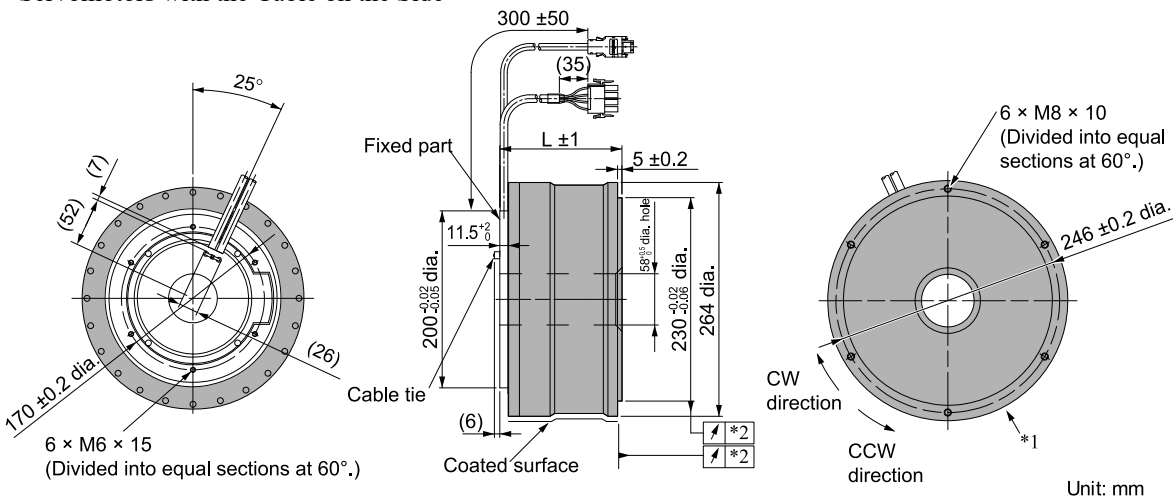
Refer to the following section for information on the external regenerative resistors.

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

## External Dimensions

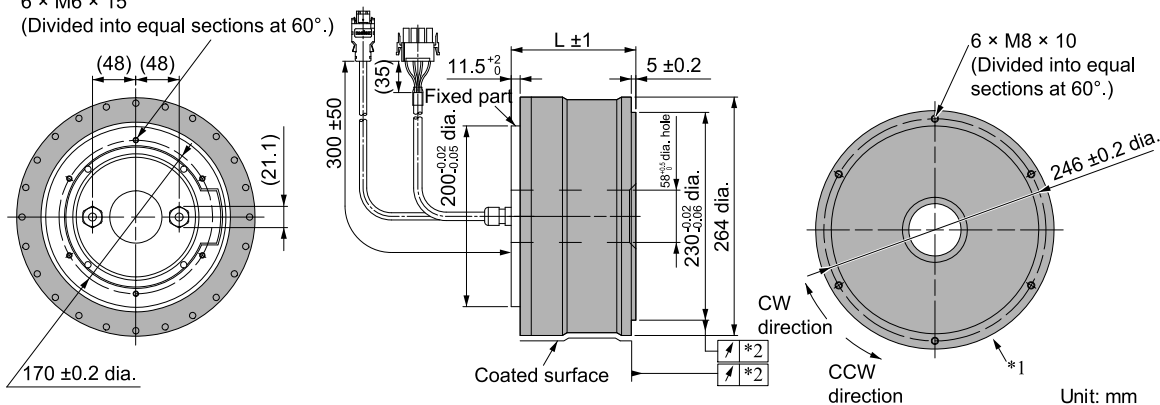
### SGM7D-□□F


· Servomotors with the Cable on the Side



· Servomotors with the Cable on the Bottom

6 × M6 × 15  
(Divided into equal sections at 60°.)



- \*1 The shaded section indicates the rotating parts.
- \*2 The precision depends on the option specification. For details, refer to the following section.  
 [Specifications on page 219](#)

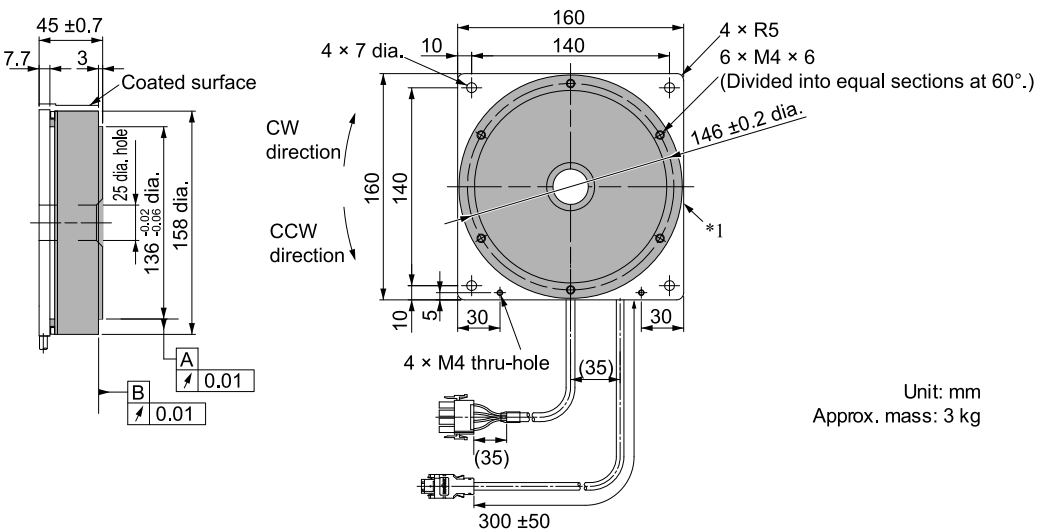
**Note:**

Values in parentheses are reference dimensions.

Model: SGM7D-	L	Approx. mass [kg]
30F□C□□	113 ±1	14.5
58F□C□□	138 ±1	19
90F□C□□	163 ±1	24
1AF□C□□	188 ±1	29

## SGM7D-01G

· Servomotors with the Cable on the Side



Unit: mm  
Approx. mass: 3 kg

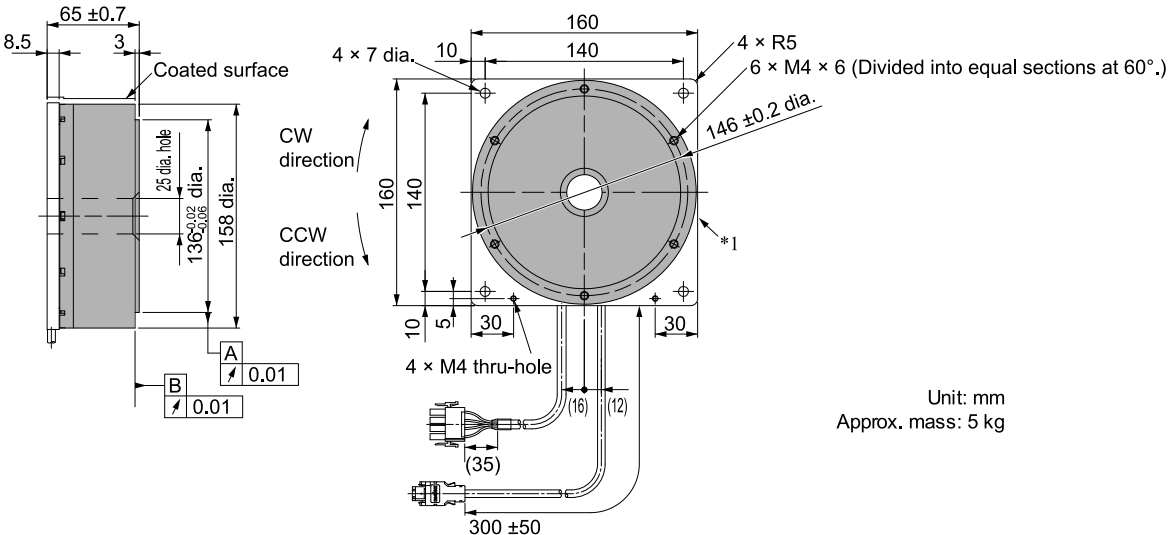
- \*1 The shaded section indicates the rotating parts.

**Note:**

Values in parentheses are reference dimensions.

## SGM7D-05G

· Servomotors with the Cable on the Side



Unit: mm  
Approx. mass: 5 kg

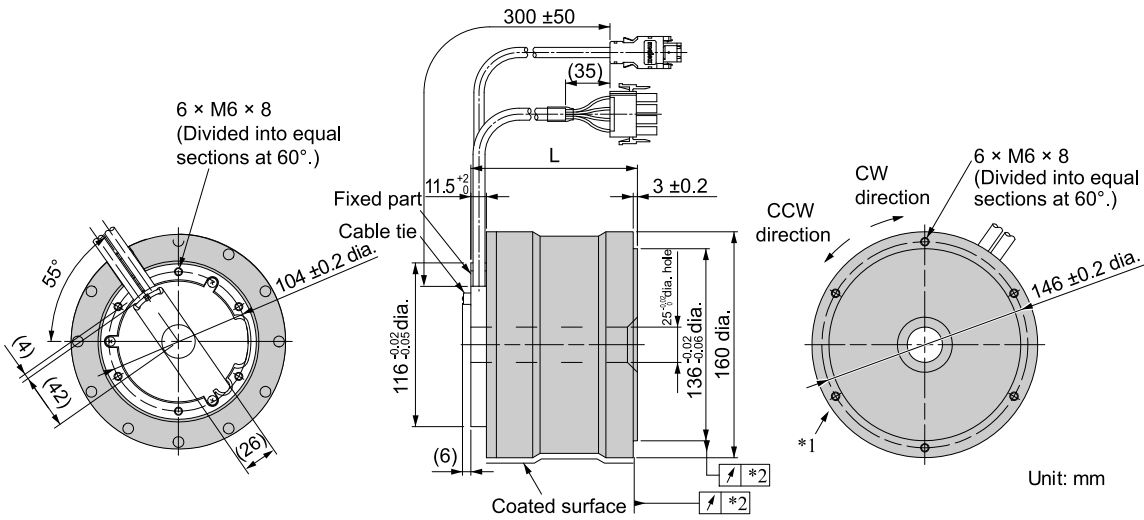
- \*1 The shaded section indicates the rotating parts.

**Note:**

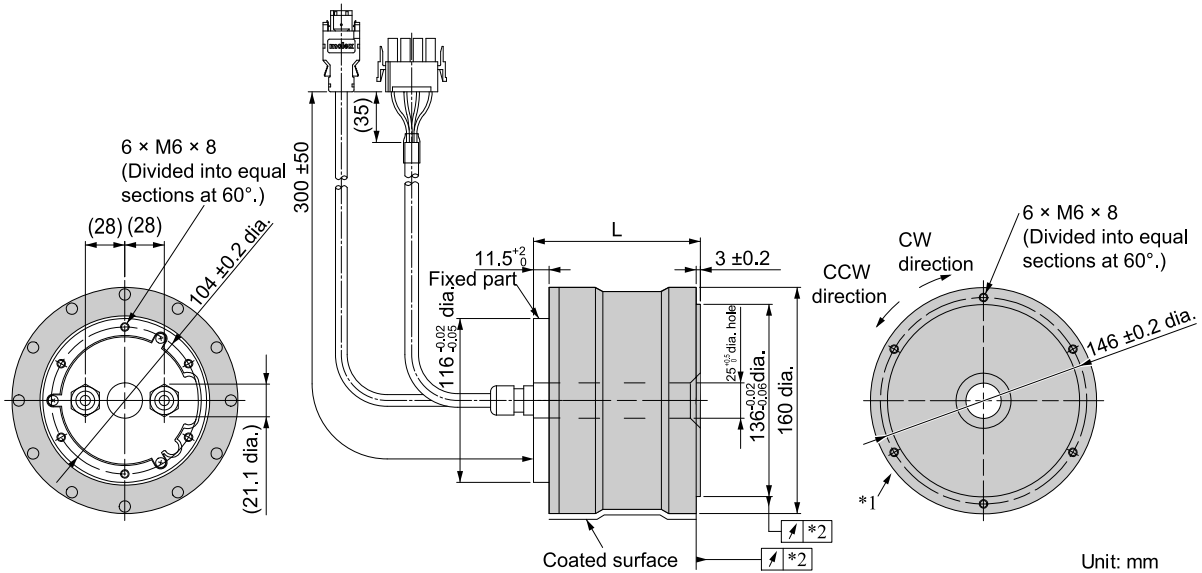
Values in parentheses are reference dimensions.

## SGM7D-08G , -18G , -24G , -34G , -45G

· Servomotors with the Cable on the Side




· Servomotors with the Cable on the Bottom



\*1 The shaded section indicates the rotating parts.

\*2 The precision depends on the option specification. For details, refer to the following section.

 [Specifications on page 219](#)

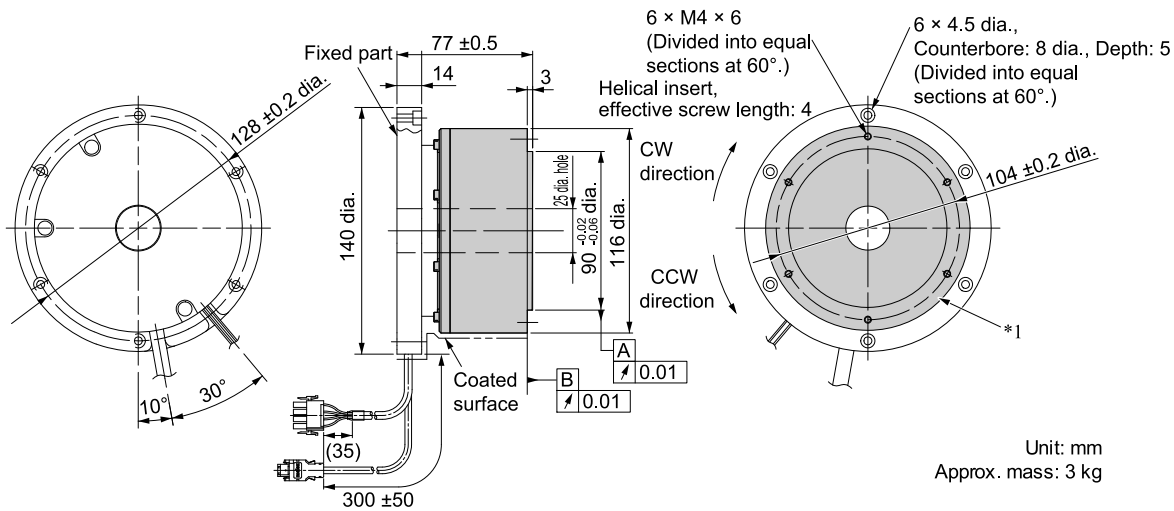
**Note:**

Values in parentheses are reference dimensions.

Model: SGM7D-	L	Approx. mass [kg]
08G□C□□	92.5 ±1	5.5
18G□C□□	118 ±1	7.5
24G□C□□	143 ±1	9.5
34G□C□□	168 ±1	12
45G□C□□	194 ±1	14

## SGM7D-03H

· Servomotors with the Cable on the Side



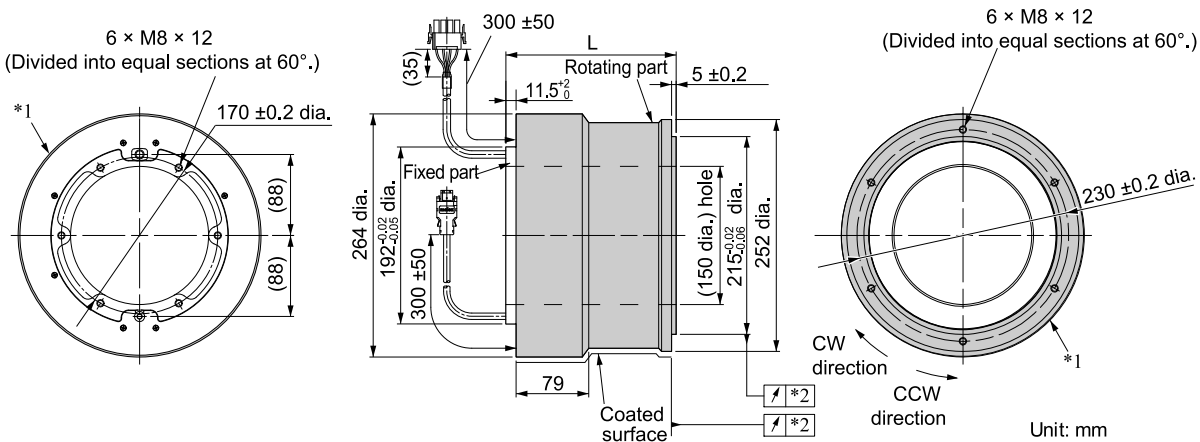
\*1 The shaded section indicates the rotating parts.

Note:

Values in parentheses are reference dimensions.

## SGM7D-□□I

· Servomotors with the Cable on the Bottom



\*1 The shaded section indicates the rotating parts.

\*2 The precision depends on the option specification. For details, refer to the following section.

[Specifications on page 219](#)

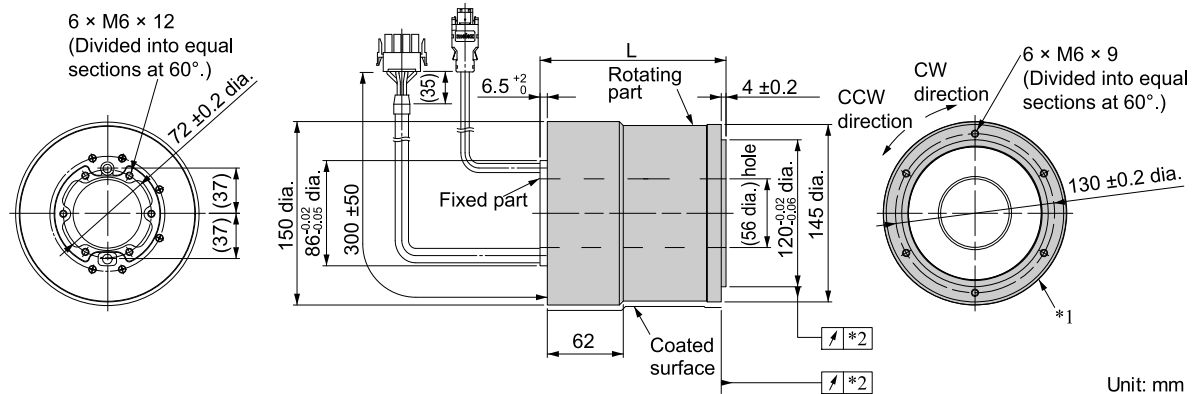
Note:

Values in parentheses are reference dimensions.

Model: SGM7D-	L	Approx. mass [kg]
28I□C5□	158 ± 1	23
70I□C5□	185 ± 1	28
1ZI□C5□	212 ± 1	33
1CI□C5□	250 ± 1	45
2BI□C5□	304 ± 1	55
2DI□C5□	358 ± 1	65

## SGM7D-06J


· Servomotors with the Cable on the Bottom



Unit: mm

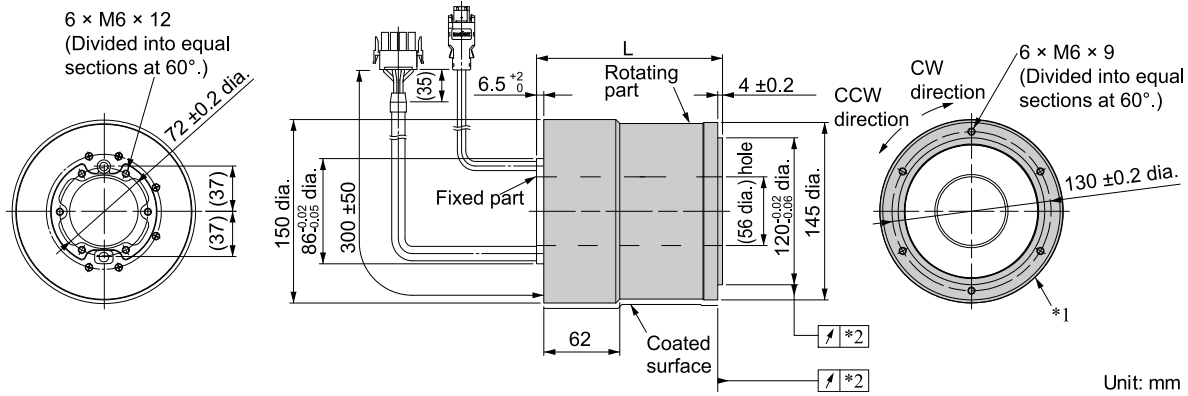
\*1 The shaded section indicates the rotating parts.

\*2 The precision depends on the option specification. For details, refer to the following section.

 [Specifications on page 219](#)


## SGM7D-09J, -18J, -20J, -38J

· Servomotors with the Cable on the Bottom



\*1 The shaded section indicates the rotating parts.

\*2 The precision depends on the option specification. For details, refer to the following section.

 [Specifications on page 219](#)

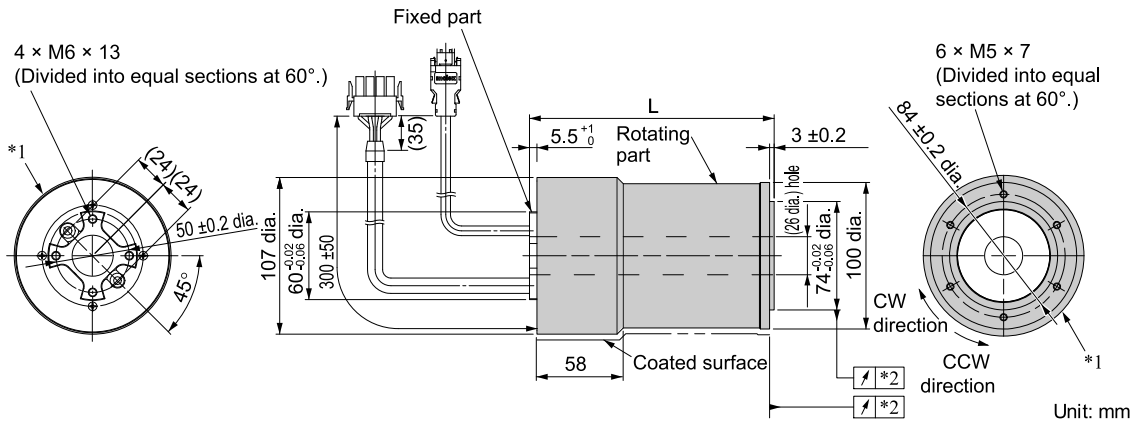
### Note:

Values in parentheses are reference dimensions.

Model: SGM7D-	L	Approx. mass [kg]
09J□C5□	123 ±1	8.0
18J□C5□	151 ±1	11.0
20J□C5□	179 ±1	13.0
38J□C5□	207 ±1	15.5

## SGM7D-□□K

· Servomotors with the Cable on the Bottom



\*1 The shaded section indicates the rotating parts.

\*2 The precision depends on the option specification. For details, refer to the following section.

[Specifications on page 219](#)

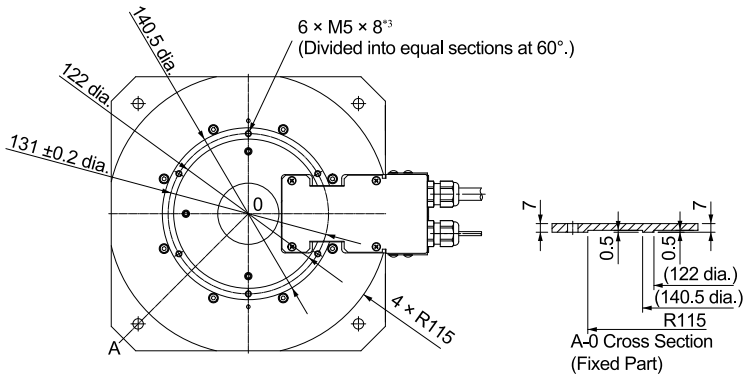
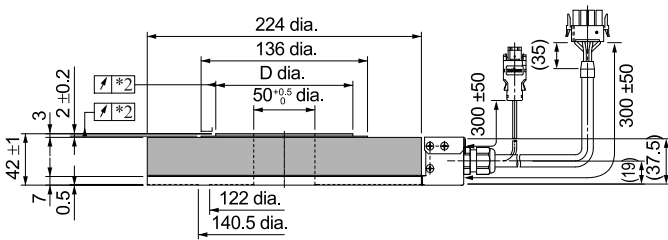
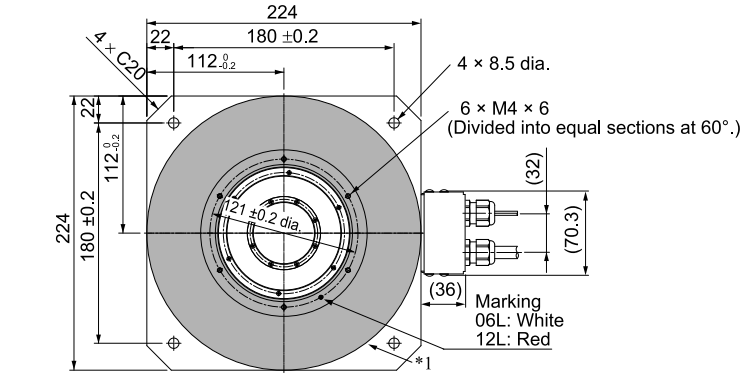
**Note:**

Values in parentheses are reference dimensions.

Model: SGM7D-	L	Approx. mass [kg]
02K□C5□	113 ± 1	4.0
06K□C5□	140 ± 1	5.0
08K□C5□	167 ± 1	6.5

## SGM7D-06L, -12L

· Servomotors with the Cable on the Side



Unit: mm  
Approx. mass: 8.1 kg

- \*1 The shaded section indicates the rotating parts.
- \*2 The precision depends on the option specification. For details, refer to the following section.  
[Specifications on page 219](#)
- \*3 In the following cases, rigidity is required in the servomotor. Therefore, secure the servomotor with these holes.
  - There is a fluctuating vertical load on the servomotor.
  - There is a moment load on the servomotor.
  - The servomotor is used hanging upside down.

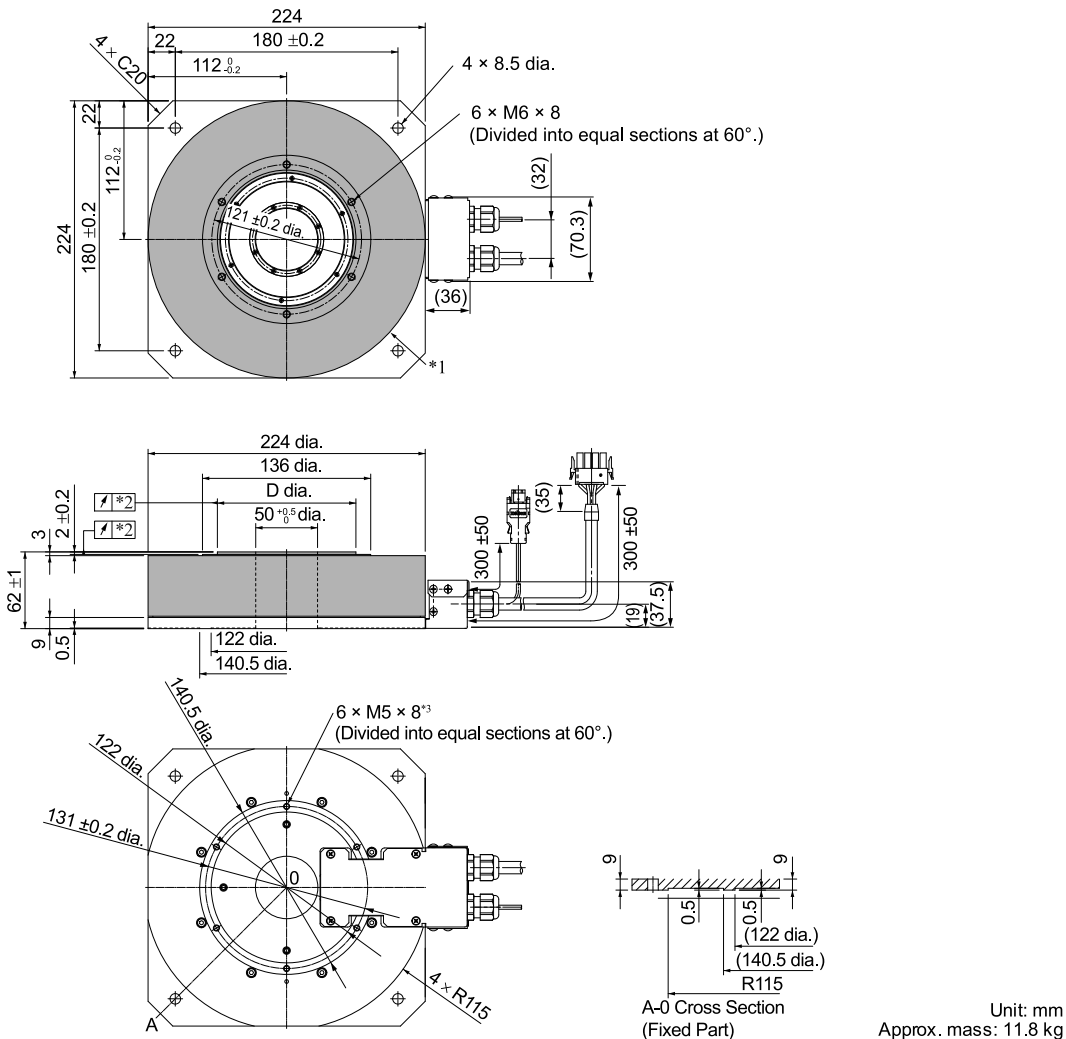
**Note:**


Values in parentheses are reference dimensions.

Model: SGM7D-	D
□□L□C42 (High mechanical precision)	111.9 <sup>-0.02</sup> <sub>-0.06</sub>
□□L□C41 (Standard mechanical precision)	112 <sup>-0.02</sup> <sub>-0.06</sub>

## SGM7D-30L

· Servomotors with the Cable on the Side



- \*1 The shaded section indicates the rotating parts.
- \*2 The precision depends on the option specification. For details, refer to the following section.  
 [Specifications on page 219](#)
- \*3 In the following cases, rigidity is required in the servomotor. Therefore, secure the servomotor with these holes.
- There is a fluctuating vertical load on the servomotor.
  - There is a moment load on the servomotor.
  - The servomotor is used hanging upside down.

**Note:**

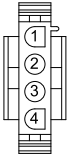
Values in parentheses are reference dimensions.

Model: SGM7D-	D
30L□C41 (Standard mechanical precision)	112 <sup>-0.02</sup> <sub>-0.06</sub>
30L□C42 (High mechanical precision)	111.9 <sup>-0.02</sup> <sub>-0.06</sub>

## Connector Specifications

### SGM7D-□□F

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

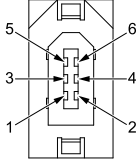
Model

- Plug: 350779-1
- Pins: 350218-3 or 350547-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)  
Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350536-3 or 350550-3

· Encoder Connector



1	PG5V
2	PG0V
3 *	BAT
4 *	BAT0
5	PS
6	/PS
Connector case	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

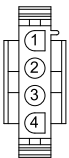
Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

### SGM7D-05G

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green

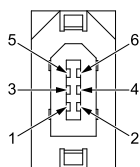
Model

- Plug: 350779-1
- Pins: 350561-3 or 350690-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)  
Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350570-3 or 350689-3

· Encoder Connector



1	PG5V
2	PG0V
3 *	BAT
4 *	BAT0
5	PS
6	/PS
<b>Connector case</b>	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

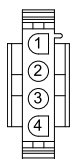
Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

## SGM7D-08G , -18G , -24G , -34G , -45G

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Model

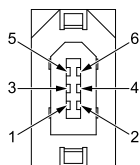
- Plug: 350779-1
- Pins: 350218-3 or 350547-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350536-3 or 350550-3

· Encoder Connector



1	PG5V
2	PG0V
3 *	BAT
4 *	BAT0
5	PS
6	/PS
<b>Connector case</b>	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

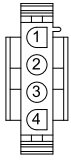
Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

## SGM7D-03H

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green

Model

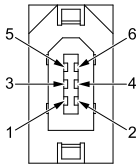
- Plug: 350779-1
- Pins: 350561-3 or 350690-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350570-3 or 350689-3

· Encoder Connector



1	PG5V
2	PG0V
3 *	BAT
4 *	BAT0
5	PS
6	/PS
Connector case	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

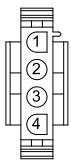
Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

## SGM7D-□□I

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Model

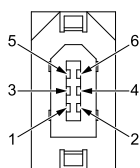
- Plug: 350779-1
- Pins: 350218-3 or 350547-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350536-3 or 350550-3

· Encoder Connector



1	PG5V
2	PG0V
3 *	BAT
4 *	BAT0
5	PS
6	/PS
<b>Connector case</b>	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

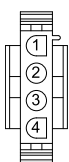
Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

## SGM7D-09J, -18J, -20J, -38J

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Model

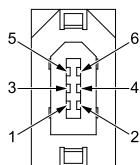
- Plug: 350779-1
- Pins: 350218-3 or 350547-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350536-3 or 350550-3

· Encoder Connector



1	PG5V
2	PG0V
3 *	BAT
4 *	BAT0
5	PS
6	/PS
<b>Connector case</b>	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

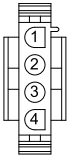
Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

## SGM7D-□□K

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green

Model

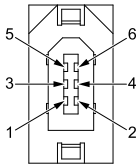
- Plug: 350779-1
- Pins: 350561-3 or 350690-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350570-3 or 350689-3

· Encoder Connector



1	PG5V
2	PG0V
3 *1	BAT
4 *1	BAT0
5	PS
6	/PS
Connector case	FG (frame ground)

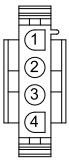
\*1 A battery is required only for a multiturn absolute encoder.

Model: 55102-0600 Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

## SGM7D-06L, -12L

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Model

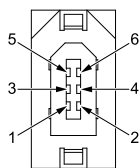
- Plug: 350779-1
- Pins: 350218-3 or 350547-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350536-3 or 350550-3

· Encoder Connector



1	PG5V
2	PG0V
3 *	BAT
4 *	BAT0
5	PS
6	/PS
<b>Connector case</b>	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

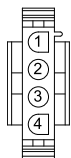
Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

## SGM7D-30L

· Servomotor Connector



1	Phase U	Red
2	Phase V	Gray
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Model

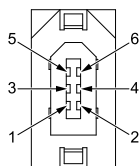
- Plug: 350779-1
- Pins: 350218-3 or 350547-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350536-3 or 350550-3

· Encoder Connector



1	PG5V
2	PG0V
3 *	BAT
4 *	BAT0
5	PS
6	/PS
<b>Connector case</b>	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

Model: 55102-0600

Manufacturer: Molex Japan LLC

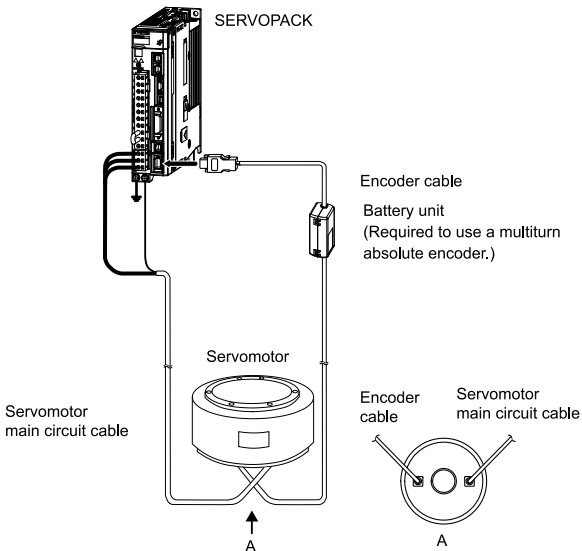
Mating connector: 54280-0609

## Selecting Cables

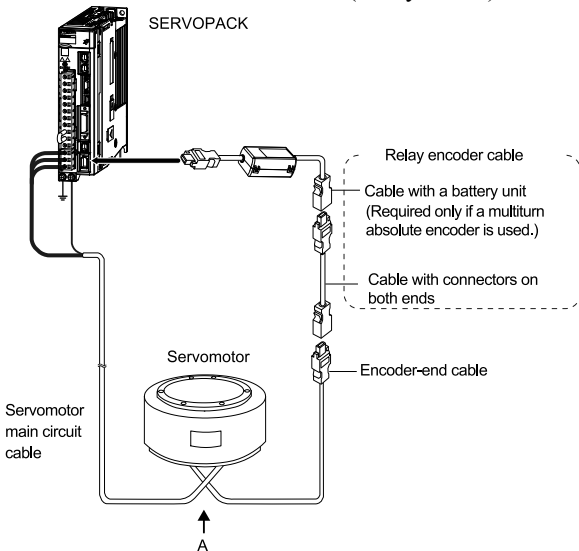
### Cable Configurations

The cables shown below are required to connect a servomotor to a SERVOPACK.

#### Encoder Cables of 20 m or Less



#### Encoder Cable of 30 m to 50 m (Relay Cable)

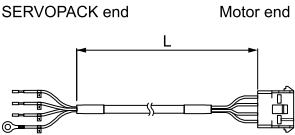
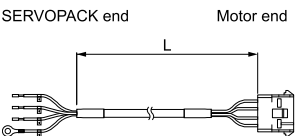


#### Note:

1. If the encoder cable length exceeds 20 m, use a relay encoder cable.
2. 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.
3. Refer to the following manual for the following information.
  - Cable dimensional drawings and cable connection specifications
  - Order numbers and specifications of individual connectors for cables
  - Order numbers and specifications for wiring materials

☞  $\Sigma$ -X-Series Peripheral Device Selection Manual (Manual No.: SIEP C710812 12)

## Servomotor Main Circuit Cables

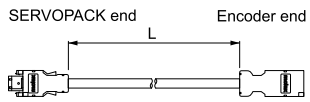
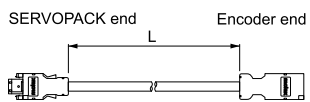
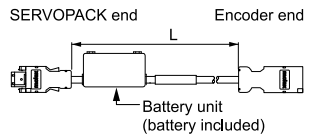
Servomotor Model	Length (L)	Order Number		Appearance
		Standard Cable	Flexible Cable *1	
SGM7D-□□F SGM7D-08G to -45G SGM7D-□□I SGM7D-□□J SGM7D-□□L	3 m	JZSP-CMM00-03-E	JZSP-C7DM21-03-E	
	5 m	JZSP-CMM00-05-E	JZSP-C7DM21-05-E	
	10 m	JZSP-CMM00-10-E	JZSP-C7DM21-10-E	
	15 m	JZSP-CMM00-15-E	JZSP-C7DM21-15-E	
	20 m	JZSP-CMM00-20-E	JZSP-C7DM21-20-E	
SGM7D-01G and -05G SGM7D-□□H SGM7D-□□K	3 m	JZSP-CMM00-03-E	JZSP-CMM01-03-E	
	5 m	JZSP-CMM00-05-E	JZSP-CMM01-05-E	
	10 m	JZSP-CMM00-10-E	JZSP-CMM01-10-E	
	15 m	JZSP-CMM00-15-E	JZSP-CMM01-15-E	
	20 m	JZSP-CMM00-20-E	JZSP-CMM01-20-E	

\*1 Use flexible cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

**Note:**

Direct drive servomotors are not available with holding brakes.

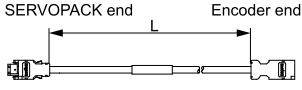
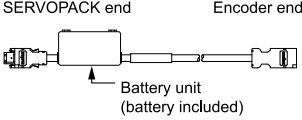
## Encoder Cables of 20 m or Less

Servomotor Model	Name	Length (L)	Order Number		Appearance
			Standard Cable	Flexible Cable *1	
All SGM7D models	For incremental encoder (without battery unit)	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	
		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
	For multiturn absolute encoder (without battery unit) *2	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	
		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
	For multiturn absolute encoder (with battery unit)	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E	
		5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E	
		10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E	
		15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	
		20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	

\*1 Use flexible cables for moving parts of machines, such as robots. The recommended bending radius (R) is 46 mm or larger.

\*2 Use one of these cables if a battery is installed at the host controller.

## Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number <sup>*1</sup>	Appearance
All SGM7D models	Cables with connectors on both ends (for incremental or multiturn absolute encoder)	30 m	JZSP-UCMP00-30-E	
		40 m	JZSP-UCMP00-40-E	
		50 m	JZSP-UCMP00-50-E	
	Cable with a battery unit (for multiturn absolute encoder) <sup>*2</sup>	0.3 m	JZSP-CSP12-E	

\*1 Flexible cables are not available.

\*2 This cable is not required if a battery is connected to the host controller.



## SGM7E

## Model Designations

SGM7E - 02 B 7 A 1 1

1st+2nd digits    3rd digit    4th digit    5th digit    6th digit    7th digit

Direct drive servomotors: SGM7E

**1st+2nd digits** Rated Output    **3rd digit** Servomotor Outer Diameter

Code	Specification
02	2.00 N·m
04	4.00 N·m
05	5.00 N·m
07	7.00 N·m
08	8.00 N·m
10	10.0 N·m
14	14.0 N·m
16	16.0 N·m
17	17.0 N·m
25	25.0 N·m
35	35.0 N·m

Code	Specification
B	135-mm dia.
C	175-mm dia.
D	230-mm dia.
E	290-mm dia.

**4th digit** Serial Encoder

Code	Specification
7	24-bit multiturn absolute encoder*1
F	24-bit incremental encoder*1

**5th digit** Design Revision Order

A

**6th digit** Flange

Code	Mounting
1	Non-load side
4	Non-load side (with cable on side)

**7th digit** Options

Code	Specification
1	Without options
2	High machine precision (runout at end of shaft and runout of shaft surface: 0.01 mm)

\*1 The encoder can be used as a single-turn absolute encoder by setting a parameter.

**Note:**

- Direct drive servomotors are not available with holding brakes.
- This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

## Manufactured Models

Rated Torque N·m	Servomotor Outer Diameter			
	B (135-mm dia.)	C (175-mm dia.)	D (230-mm dia.)	E (290-mm dia.)
2.00	SGM7E-02B	-	-	-
4.00	-	SGM7E-04C	-	-
5.00	SGM7E-05B	-	-	-
7.00	SGM7E-07B	-	-	-
8.00	-	-	SGM7E-08D	-
10.0	-	SGM7E-10C	-	-
14.0	-	SGM7E-14C	-	-
16.0	-	-	-	SGM7E-16E
17.0	-	-	SGM7E-17D	-
25.0	-	-	SGM7E-25D	-
35.0	-	-	-	SGM7E-35E

**Note:**

The above table shows combinations of the rated torque and outer diameter. The fourth through seventh digits have been omitted.

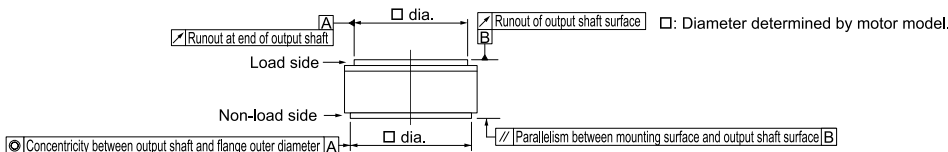
## Specifications and Ratings

### Specifications

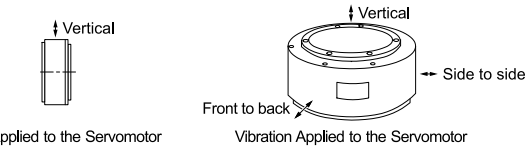
Voltage		200 V										
Model: SGM7E-		02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E
Time Rating		Continuous										
Thermal Class		A										
Insulation Resistance		500 VDC, 10 MΩ min.										
Withstand Voltage		1500 VAC for 1 minute										
Excitation		Permanent magnet										
Mounting		Flange-mounted										
Drive Method		Direct drive										
Rotation Direction		Counterclockwise (CCW) for forward reference when viewed from the load side										
Vibration Class *1		V15										
Absolute Accuracy		±15 s										
Repeatability		±1.3 s										
Protective Structure *2		Totally enclosed, self-cooled, IP42 (The protective structure is IP40 for CE Marking.)										
Environmental Conditions	Surrounding Air Temperature		0°C to 40°C (with no freezing)									
	Surrounding Air Humidity		20% to 80% relative humidity (with no condensation)									
	Installation Site		<ul style="list-style-type: none"> <li>• Must be indoors and free of corrosive and explosive gases.</li> <li>• Must be well-ventilated and free of dust and moisture.</li> <li>• Must facilitate inspection and cleaning.</li> <li>• Must have an altitude of 1000 m or less.</li> <li>• Must be free of strong magnetic fields.</li> </ul>									
	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)									
Mechanical Tolerances *3	Runout of Output Shaft Surface	mm	0.02 (0.01 for high machine precision option)									
	Runout at End of Output Shaft	mm	0.04 (0.01 for high machine precision option)									
	Parallelism between Mounting Surface and Output Shaft Surface	mm	0.07					0.08				
	Concentricity between Output Shaft and Flange Outer Diameter	mm	0.07					0.08				
Impact Resistance *4	Impact Acceleration at Flange		490 m/s <sup>2</sup>									
	Number of Impacts		2 times									
Vibration Resistance *4	Vibration Acceleration at Flange		49 m/s <sup>2</sup>									
Applicable SERVOPACKs		SGDXS-	2R8A								5R5A	
		SGDXW-										

\*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 hollow hole section, motor mounting surface, output shaft surface, and gap around the rotating part of the shaft are excluded. Protective structure specifications apply only when the special cable is used. The protective structure is IP40 for CE Marking.
- \*3 Refer to the following figure for the relevant locations on the servomotor. Refer to the dimensional drawings of the individual servomotors for more information on tolerances.



- \*4 The given values are for when the servomotor shaft is mounted horizontally and shock or vibration is applied in the directions shown in the following figures.



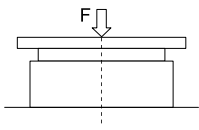
Shock Applied to the Servomotor

Vibration Applied to the Servomotor

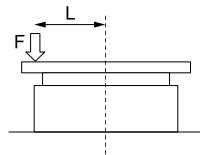
## Ratings

Voltage		200 V											
Model: SGM7E-		02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E	
Rated Output *1	W	42	105	147	84	209	293	168	356	393	335	550	
Rated Torque *2	N·m	2.00	5.00	7.00	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0	
Instantaneous Maximum Torque *1	N·m	6.00	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	Arms	1.8	1.7	1.4	2.2		2.8	1.9	2.5	2.6	3.3	3.5	
Instantaneous Maximum Current *1	Arms	5.4	5.1	4.1	7.0		8.3	5.6	7.5	8.0	9.4	10.0	
Rated Rotation Speed *1	min <sup>-1</sup>	200			200			200		150	200	150	
Maximum Rotation Speed *1	min <sup>-1</sup>	500			500	400	300	500	350	250	500	250	
Torque Constant	N·m/Arms	1.18	3.17	5.44	2.04	5.05	5.39	5.10	7.79	10.8	5.58	11.1	
Rotor Moment of Inertia	×10 <sup>-4</sup> kg·m <sup>2</sup>	28.0	51.0	77.0	77.0	140	220	285	510	750	930	1430	
Rated Power Rate *1	kW/s	1.43	4.90	6.36	2.08	7.14	8.91	2.25	5.67	8.33	2.75	8.57	
Rated Angular Acceleration *1	rad/s <sup>2</sup>	710	980	910	520	710	640	280	330		170	240	
Heat Sink Size	mm	350 × 350 × 12			450 × 450 × 12			550 × 550 × 12			650 × 650 × 12		
Allowable Load Moment of Inertia (Motor Moment of Inertia Ratio)	times	10				5	3						
	With external regenerative resistor	10				5	3						
Allowable Load *3	Allowable Thrust Load	N	1500			3300			4000			11000	
	Allowable Moment Load	N·m	40	50	64	70	75	90	93	103	135	250	320

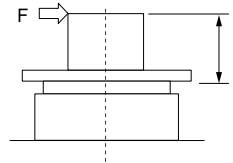
- \*1 These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.
- \*2 The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a steel heat sink of the dimensions given in the table.
- \*3 The thrust loads and moment loads that are applied while a servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = 0



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = F × L



Where F is the external force,  
Thrust load = Load mass  
Moment load = F × L

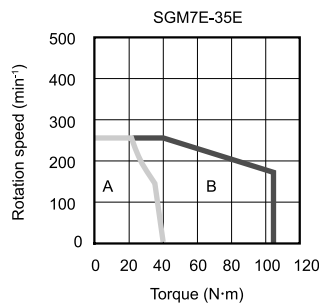
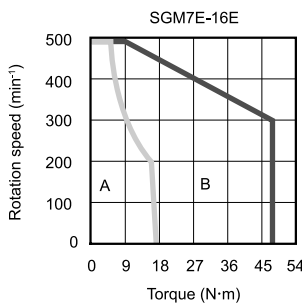
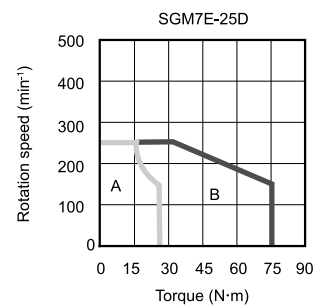
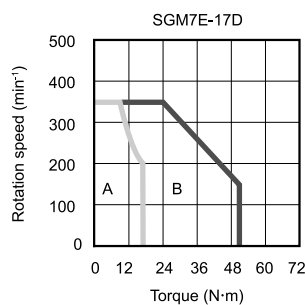
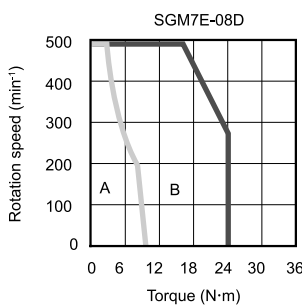
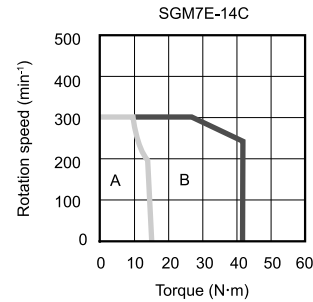
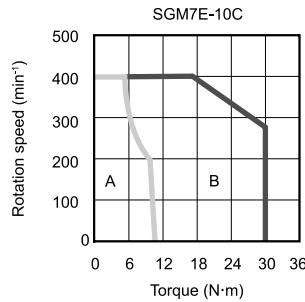
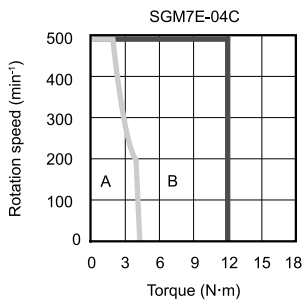
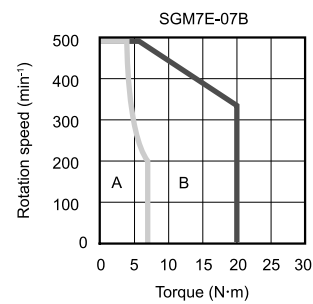
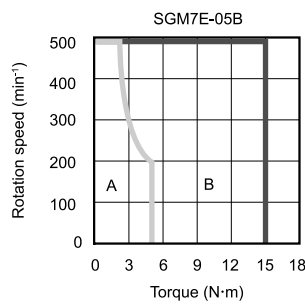
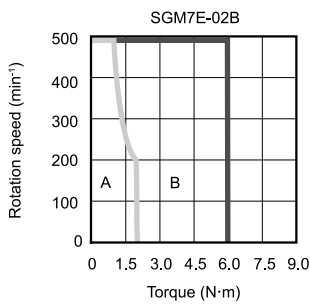
**Note:**

For the bearings used in these servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

## Torque-Motor Speed Characteristics

**A** : Continuous duty zone

**B** : Intermittent duty zone

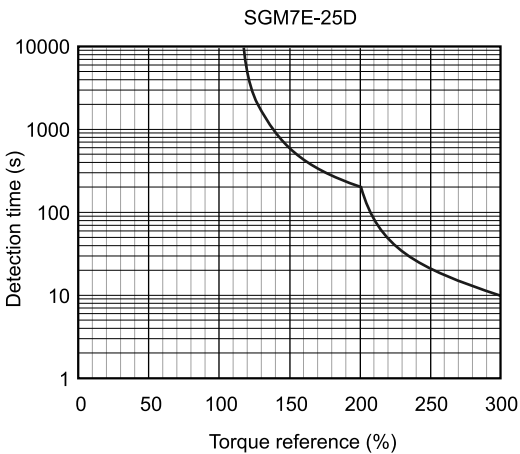
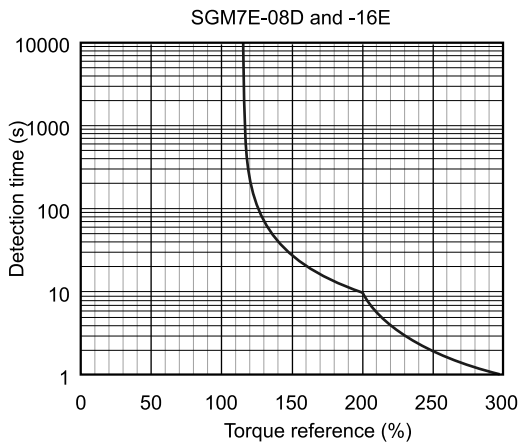
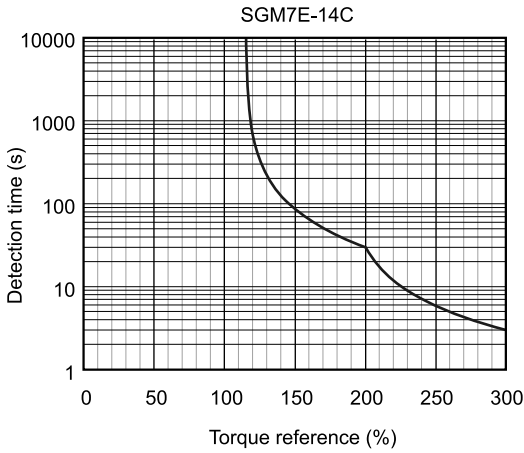
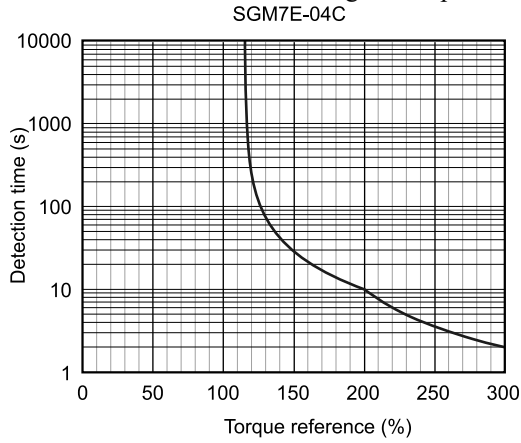
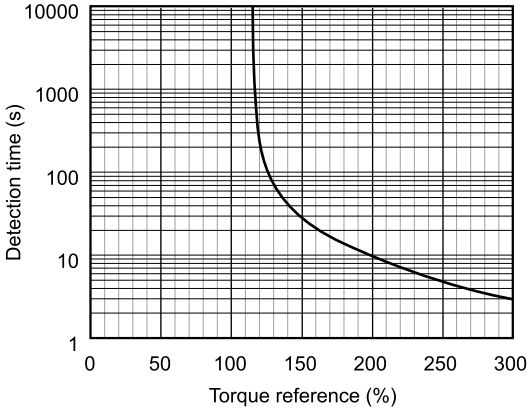


**Note:**

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.  
SGM7E-02B, -05B, -07B, -10C, -17D, and -35E



**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. Refer to the following section for details on the effective torque.

 [Torque-Motor Speed Characteristics on page 255](#)

## Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the servomotors are given in "[Ratings on page 254](#)". 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 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.

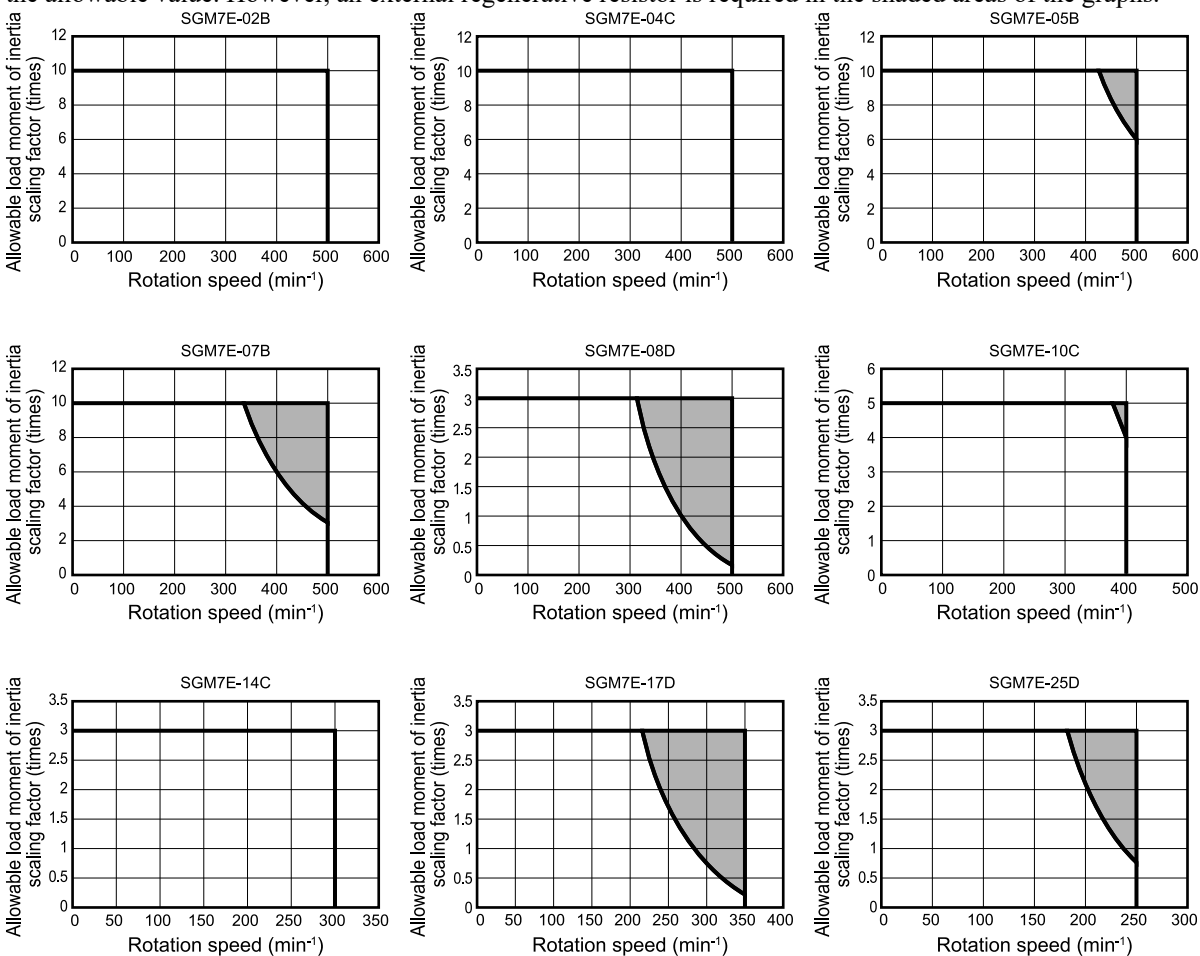
If the above steps is not possible, install an external regenerative resistor.

**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). Install an external regenerative resistor when the built-in regenerative resistor cannot process all of the regenerative power. 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](#)

### ■ 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, an external regenerative resistor is required in the shaded areas of the graphs.



**Note:**

Applicable SERVOPACK Model: SGDXS-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+.

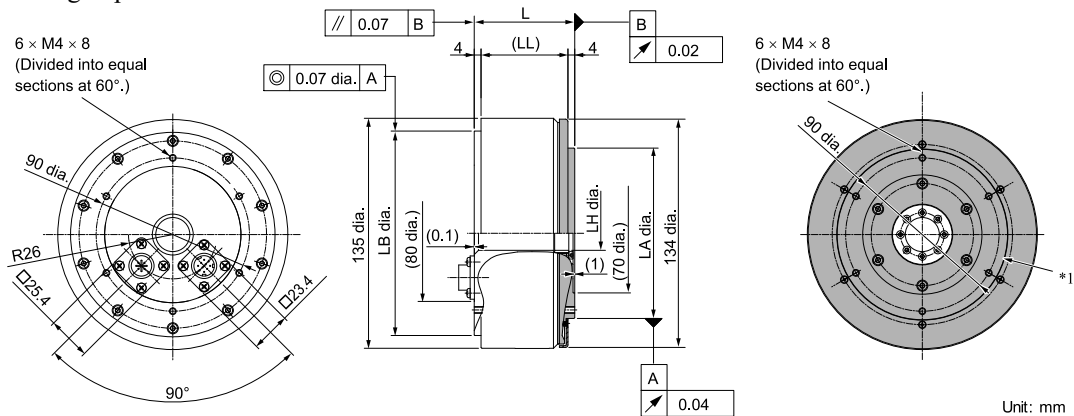
Refer to the following section for information on the external regenerative resistors.

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

## External Dimensions

### SGM7E-□□B

#### · Flange Specification 1



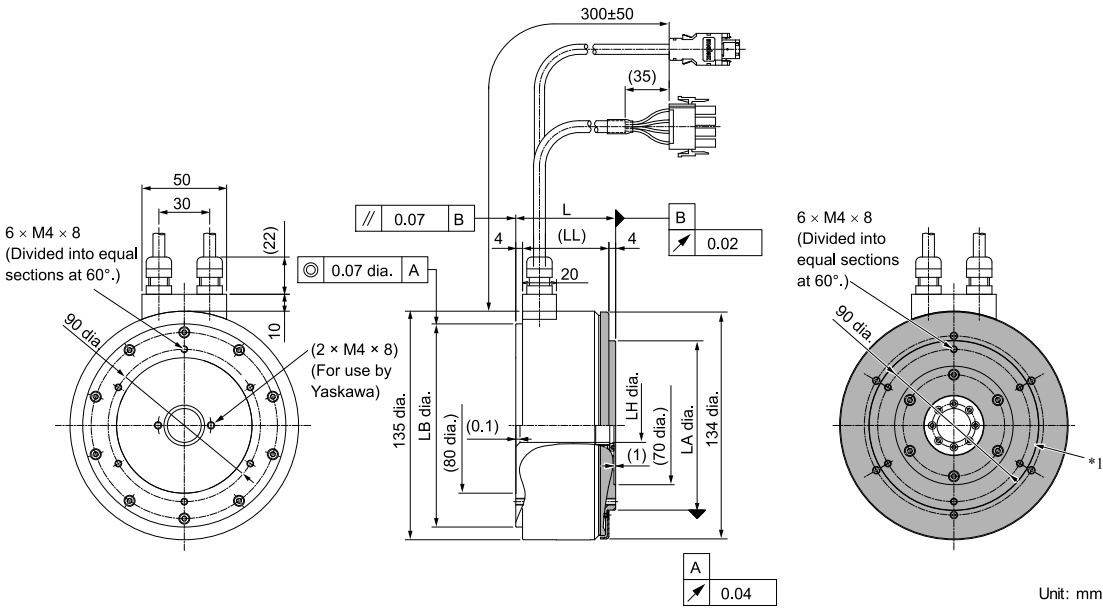
\*1 The shaded section indicates the rotating parts.

#### Note:

Values in parentheses are reference dimensions.

Model: SGM7E-	L	(LL)	LB	LH	LA	Approx. mass [kg]
02B□A11	59	51	120 <sup>0</sup> <sub>-0.035</sub>	20 <sup>+0.4</sup> <sub>0</sub>	100 <sup>0</sup> <sub>-0.035</sub>	4.8
05B□A11	88	80	120 <sup>0</sup> <sub>-0.035</sub>	20 <sup>+0.4</sup> <sub>0</sub>	100 <sup>0</sup> <sub>-0.035</sub>	5.8
07B□A11	128	120	120 <sup>0</sup> <sub>-0.035</sub>	20 <sup>+0.4</sup> <sub>0</sub>	100 <sup>0</sup> <sub>-0.035</sub>	8.2

#### · Flange Specification 4



\*1 The shaded section indicates the rotating parts.

**Note:**

Values in parentheses are reference dimensions.

Model: SGM7E-	L	(LL)	LB	LH	LA	Approx. mass [kg]
02B□A41	59	51	120 <sup>0</sup> <sub>-0.035</sub>	20 <sup>+0.4</sup> <sub>0</sub>	100 <sup>0</sup> <sub>-0.035</sub>	4.8
05B□A41	88	80	120 <sup>0</sup> <sub>-0.035</sub>	20 <sup>+0.4</sup> <sub>0</sub>	100 <sup>0</sup> <sub>-0.035</sub>	5.8
07B□A41	128	120	120 <sup>0</sup> <sub>-0.035</sub>	20 <sup>+0.4</sup> <sub>0</sub>	100 <sup>0</sup> <sub>-0.035</sub>	8.2

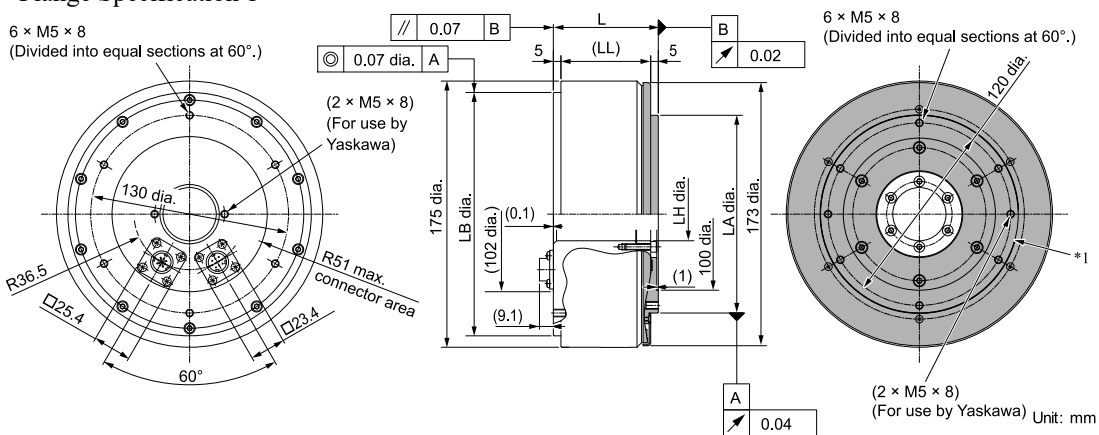
Refer to the following section for information on connector models.

[Connector Specifications on page 265](#)

## SGM7E-□□C

### · Flange Specification 1

6 × M5 × 8  
(Divided into equal sections at 60°.)



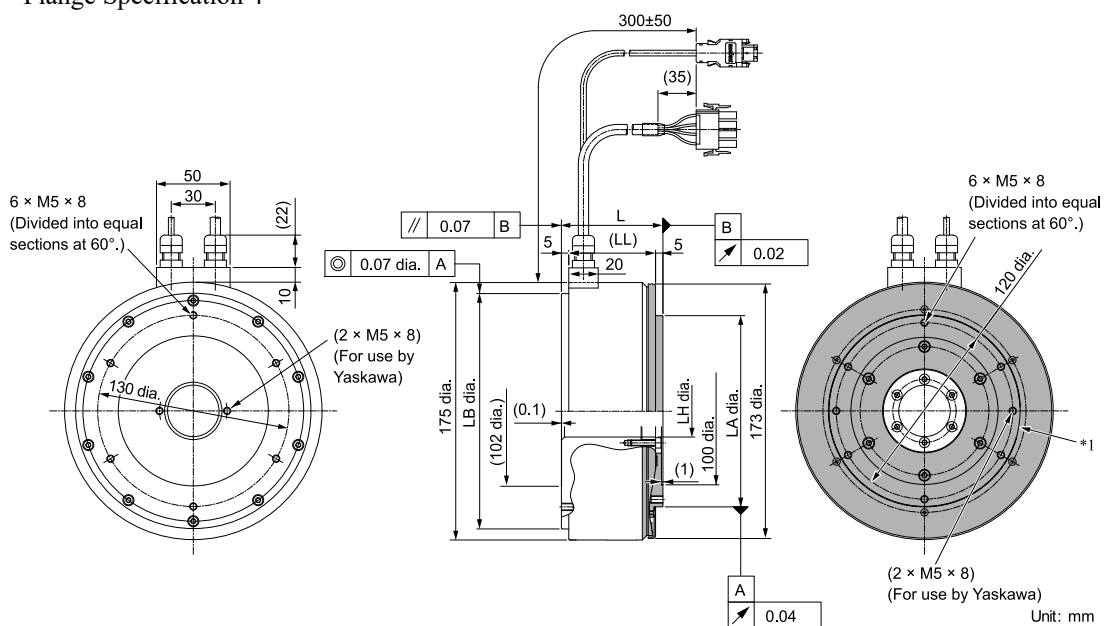
\*1 The shaded section indicates the rotating parts.

**Note:**

Values in parentheses are reference dimensions.

Model: SGM7E-	L	(LL)	LB	LH	LA	Approx. mass [kg]
04C□A11	69	59	160 <sup>0</sup> <sub>-0.040</sub>	35 <sup>+0.4</sup> <sub>0</sub>	130 <sup>0</sup> <sub>-0.040</sub>	7.2
10C□A11	90	80	160 <sup>0</sup> <sub>-0.040</sub>	35 <sup>+0.4</sup> <sub>0</sub>	130 <sup>0</sup> <sub>-0.040</sub>	10.2
14C□A11	130	120	160 <sup>0</sup> <sub>-0.040</sub>	35 <sup>+0.4</sup> <sub>0</sub>	130 <sup>0</sup> <sub>-0.040</sub>	14.2

· Flange Specification 4



\*1 The shaded section indicates the rotating parts.

**Note:**

Values in parentheses are reference dimensions.

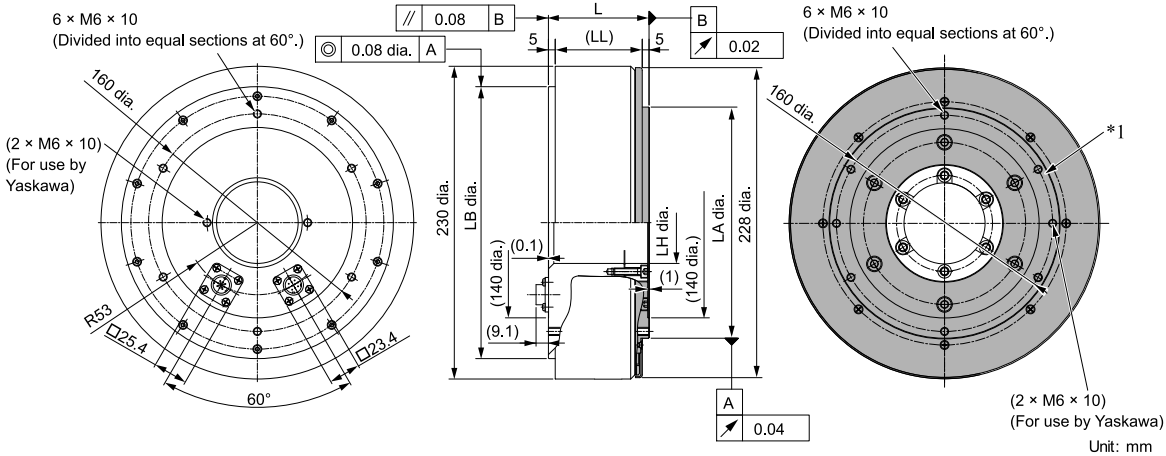
Model: SGM7E-	L	(LL)	LB	LH	LA	Approx. mass [kg]
04C□A41	69	59	160 <sup>0</sup> <sub>-0.040</sub>	35 <sup>+0.4</sup> <sub>0</sub>	130 <sup>0</sup> <sub>-0.040</sub>	7.2
10C□A41	90	80	160 <sup>0</sup> <sub>-0.040</sub>	35 <sup>+0.4</sup> <sub>0</sub>	130 <sup>0</sup> <sub>-0.040</sub>	10.2
14C□A41	130	120	160 <sup>0</sup> <sub>-0.040</sub>	35 <sup>+0.4</sup> <sub>0</sub>	130 <sup>0</sup> <sub>-0.040</sub>	14.2

Refer to the following section for information on connector models.

[Connector Specifications on page 265](#)

## SGM7E-□□D

· Flange Specification 1



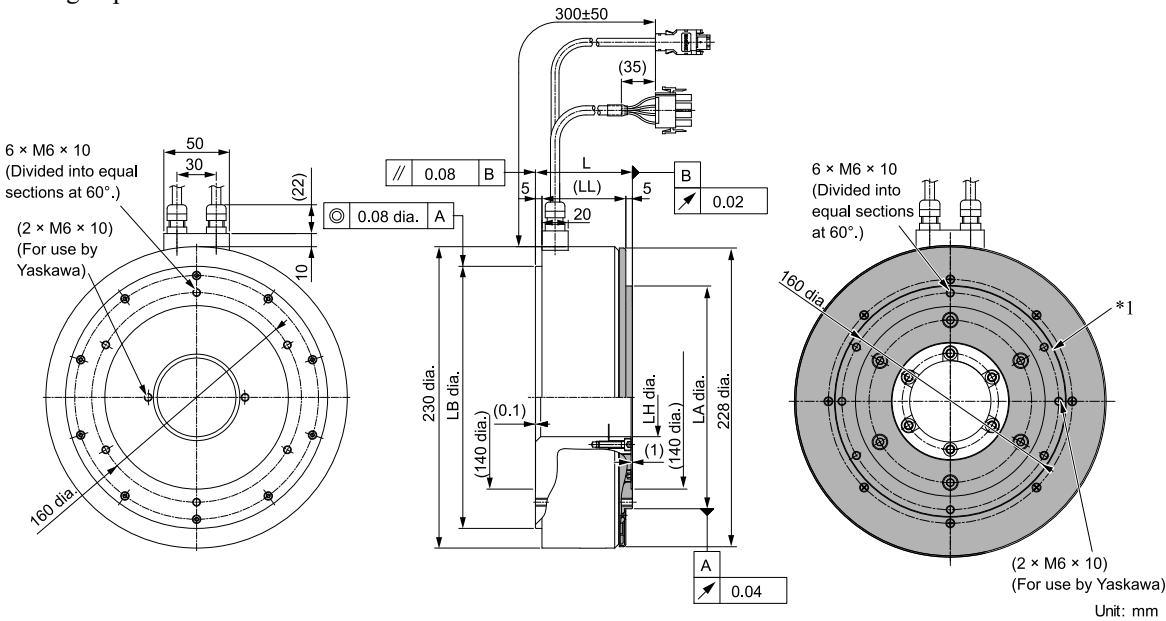
\*1 The shaded section indicates the rotating parts.

**Note:**

Values in parentheses are reference dimensions.

Model: SGM7E-	L	(LL)	LB	LH	LA	Approx. mass [kg]
08D□A11	74	64	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	170 <sup>0</sup> <sub>-0.040</sub>	14.0
17D□A11	110	100	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	170 <sup>0</sup> <sub>-0.040</sub>	22.0
25D□A11	160	150	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	170 <sup>0</sup> <sub>-0.040</sub>	29.7

· Flange Specification 4



\*1 The shaded section indicates the rotating parts.

**Note:**

Values in parentheses are reference dimensions.

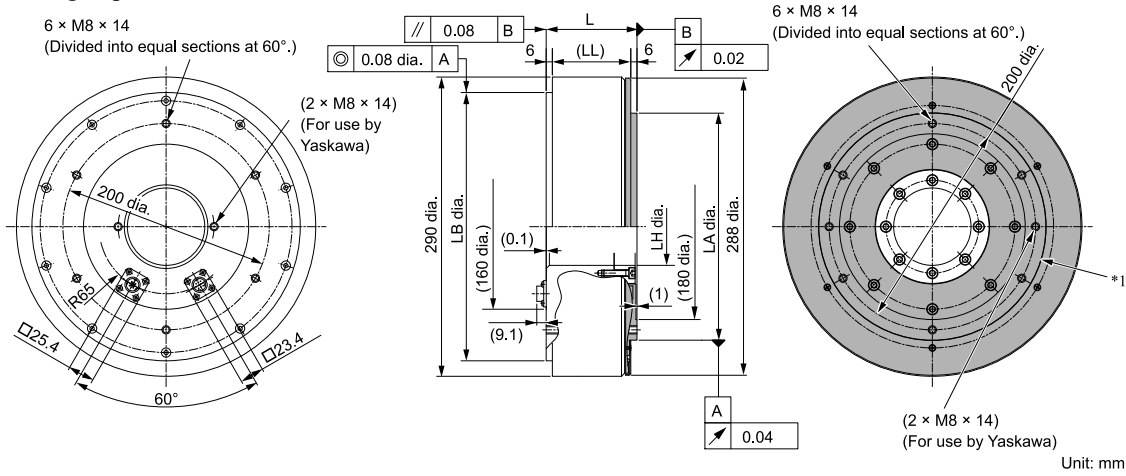
Model: SGM7E-	L	(LL)	LB	LH	LA	Approx. mass [kg]
08D□A41	74	64	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	170 <sup>0</sup> <sub>-0.040</sub>	14.0
17D□A41	110	100	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	170 <sup>0</sup> <sub>-0.040</sub>	22.0
25D□A41	160	150	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	170 <sup>0</sup> <sub>-0.040</sub>	29.7

Refer to the following section for information on connector models.

 [Connector Specifications on page 265](#)

## SGM7E-□□E

### · Flange Specification 1



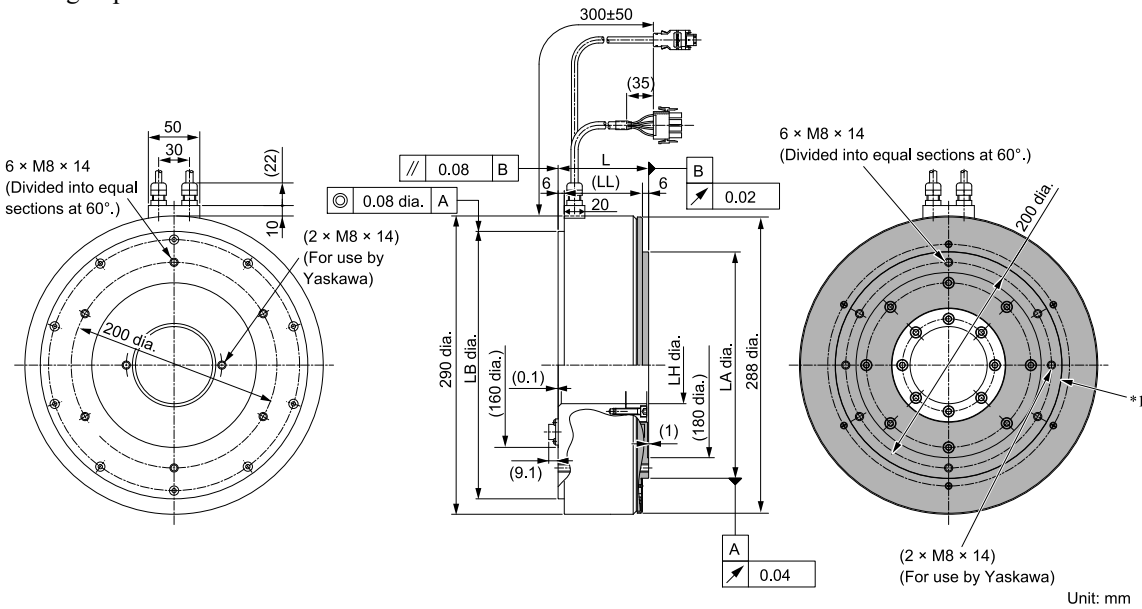
\*1 The shaded section indicates the rotating parts.

**Note:**

Values in parentheses are reference dimensions.

Model: SGM7E-	L	(LL)	LB	LH	LA	Approx. mass [kg]
16E□A11	88	76	260 <sup>0</sup> <sub>-0.052</sub>	75 <sup>+0.4</sup> <sub>0</sub>	220 <sup>0</sup> <sub>-0.046</sub>	26.0
35E□A11	112	100	260 <sup>0</sup> <sub>-0.052</sub>	75 <sup>+0.4</sup> <sub>0</sub>	220 <sup>0</sup> <sub>-0.046</sub>	34.0

### · Flange Specification 4



\*1 The shaded section indicates the rotating parts.

**Note:**

Values in parentheses are reference dimensions.

Model: SGM7E-	L	(LL)	LB	LH	LA	Approx. mass [kg]
16E□A41	88	76	260 <sup>0</sup> <sub>-0.052</sub>	75 <sup>+0.4</sup> <sub>0</sub>	220 <sup>0</sup> <sub>-0.046</sub>	26.0
35E□A41	112	100	260 <sup>0</sup> <sub>-0.052</sub>	75 <sup>+0.4</sup> <sub>0</sub>	220 <sup>0</sup> <sub>-0.046</sub>	34.0

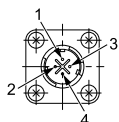
Refer to the following section for information on connector models.

 [Connector Specifications on page 265](#)

## Connector Specifications

### Flange Specification 1

· Servomotor Connector



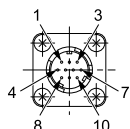
1	Phase U
2	Phase V
3	Phase W
4	FG (frame ground)

Model: JN1AS04MK2R

Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS04FK1 (Not provided by Yaskawa.)

· Encoder Connector



1	PS
2	/PS
3	-
4	PG5V
5 *1	BAT0
6	-
7	FG (frame ground)
8 *1	BAT
9	PG0V
10	-

\*1 A battery is required only for a multiturn absolute encoder.

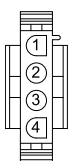
Model: JN1AS10ML1-R

Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1 (Not provided by Yaskawa.)

### Flange Specification 4

· Servomotor Connector



1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Model

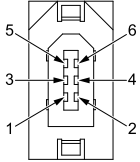
- Plug: 350779-1
- Pins: 350561-3 or 350690-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350570-3 or 350689-3

Encoder Connector



1	PG5V
2	PG0V
3 *1	BAT
4 *1	BAT0
5	PS
6	/PS
Connector case	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

Model: 55102-0600

Manufacturer: Molex Japan LLC

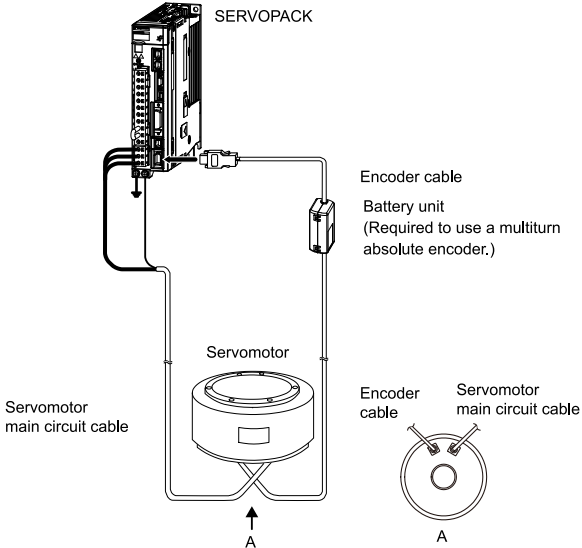
Mating connector: 54280-0609

## Selecting Cables

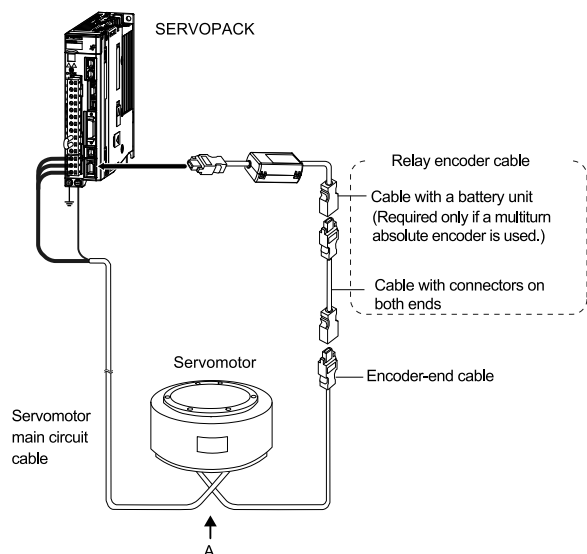
### Cable Configurations

The cables shown below are required to connect a servomotor to a SERVOPACK.

Encoder Cables of 20 m or Less



Encoder Cable of 30 m to 50 m (Relay Cable)



**Note:**

1. If the encoder cable length exceeds 20 m, use a relay encoder cable.
2. 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.
3. Refer to the following manual for the following information.
  - Cable dimensional drawings and cable connection specifications
  - Order numbers and specifications of individual connectors for cables
  - Order numbers and specifications for wiring materials

☞ Σ-X-Series Peripheral Device Selection Manual (Manual No.: SIEP C710812 12)

## Servomotor Main Circuit Cables

Servomotor Model	Length (L)	Order Number		Appearance
		Standard Cable	Flexible Cable <sup>*1</sup>	
SGM7E-□□□□ Flange Specification <sup>*2</sup> : 1	3 m	JZSP-CMM60-03-E	JZSP-C7MDN23-03-E	
	5 m	JZSP-CMM60-05-E	JZSP-C7MDN23-05-E	
	10 m	JZSP-CMM60-10-E	JZSP-C7MDN23-10-E	
	15 m	JZSP-CMM60-15-E	JZSP-C7MDN23-15-E	
	20 m	JZSP-CMM60-20-E	JZSP-C7MDN23-20-E	
SGM7E-□□□□ Flange Specification <sup>*2</sup> : 4	3 m	JZSP-CMM00-03-E	JZSP-C7MDS23-03-E	
	5 m	JZSP-CMM00-05-E	JZSP-C7MDS23-05-E	
	10 m	JZSP-CMM00-10-E	JZSP-C7MDS23-10-E	
	15 m	JZSP-CMM00-15-E	JZSP-C7MDS23-15-E	
	20 m	JZSP-CMM00-20-E	JZSP-C7MDS23-20-E	

<sup>\*1</sup> Use flexible cables for moving parts of machines, such as robots. The recommended bending radius (R) is 90 mm or larger.

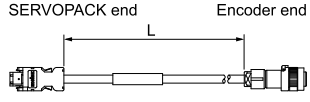
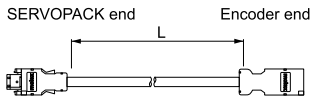
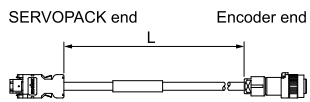
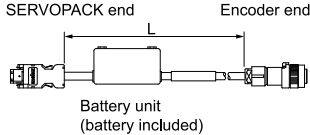
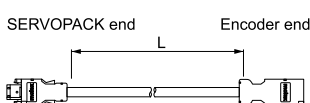
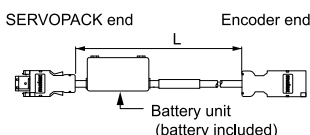
<sup>\*2</sup> Refer to the following section for flange specifications.

☞ [Model Designations on page 252](#)

**Note:**


Direct drive servomotors are not available with holding brakes.

## Encoder Cables of 20 m or Less

Servomotor Model	Name	Length (L)	Order Number		Appearance
			Standard Cable	Flexible Cable <sup>*1</sup>	
SGM7E-□□□F Flange Specification <sup>*2</sup> : 1	For incremental encoder	3 m	JZSP-CMP60-03-E	JZSP-CSP60-03-E	
		5 m	JZSP-CMP60-05-E	JZSP-CSP60-05-E	
		10 m	JZSP-CMP60-10-E	JZSP-CSP60-10-E	
		15 m	JZSP-CMP60-15-E	JZSP-CSP60-15-E	
		20 m	JZSP-CMP60-20-E	JZSP-CSP60-20-E	
SGM7E-□□□F Flange Specification <sup>*2</sup> : 4		3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	
		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
SGM7E-□□□7 Flange Specification <sup>*2</sup> : 1	For multiturn absolute encoder (without battery unit) <sup>*3</sup>	3 m	JZSP-C7PI00-03-E	JZSP-C7PI20-03-E	
		5 m	JZSP-C7PI00-05-E	JZSP-C7PI20-05-E	
		10 m	JZSP-C7PI00-10-E	JZSP-C7PI20-10-E	
		15 m	JZSP-C7PI00-15-E	JZSP-C7PI20-15-E	
		20 m	JZSP-C7PI00-20-E	JZSP-C7PI20-20-E	
	For multiturn absolute encoder (with battery unit)	3 m	JZSP-C7PA00-03-E	JZSP-C7PA20-03-E	
		5 m	JZSP-C7PA00-05-E	JZSP-C7PA20-05-E	
		10 m	JZSP-C7PA00-10-E	JZSP-C7PA20-10-E	
		15 m	JZSP-C7PA00-15-E	JZSP-C7PA20-15-E	
		20 m	JZSP-C7PA00-20-E	JZSP-C7PA20-20-E	
SGM7E-□□□7 Flange Specification <sup>*2</sup> : 4	For multiturn absolute encoder (without battery unit) <sup>*3</sup>	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	
		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
	For multiturn absolute encoder (with battery unit)	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E	
		5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E	
		10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E	
		15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	
		20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	

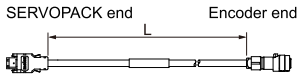
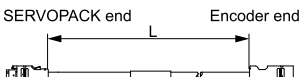
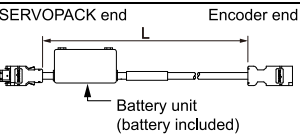
\*1 Use flexible cables for moving parts of machines, such as robots. The recommended bending radius (R) is 46 mm or larger.

\*2 Refer to the following section for flange specifications.

 [Model Designations on page 252](#)


\*3 Use one of these cables if a battery is installed at the host controller.

## Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number *1	Appearance
SGM7E-□□□F SGM7E-□□□7 Flange Specification *2: 1	Encoder cable (for incremental or multiturn absolute encoder)	0.3 m	JZSP-C7PRC0-E	
SGM7E-□□□F SGM7E-□□□7 Flange Specification *2: 1 or 4	Cables with connectors on both ends (for incremental or multiturn absolute encoder)	30 m	JZSP-UCMP00-30-E	
		40 m	JZSP-UCMP00-40-E	
		50 m	JZSP-UCMP00-50-E	
SGM7E-□□□7 Flange Specification *2: 1 or 4	Cable with a battery unit (for multiturn absolute encoder) *3	0.3 m	JZSP-CSP12-E	

\*1 Flexible cables are not available.

\*2 Refer to the following section for flange specifications.

 [Model Designations on page 252](#)

\*3 This cable is not required if a battery is connected to the host controller.

# SGM7F

## Model Designations

SGM7F - 02 A 7 A 1 1

1st+2nd digits    3rd digit    4th digit    5th digit    6th digit    7th digit

Direct drive servomotors: SGM7F

**1st+2nd digits** Rated Output

• Small Capacity

Code	Specification
02	2.00 N·m
04	4.00 N·m
05	5.00 N·m
07	7.00 N·m
08	8.00 N·m
10	10.0 N·m
14	14.0 N·m
16	16.0 N·m
17	17.0 N·m
25	25.0 N·m
35	35.0 N·m

• Medium Capacity

Code	Specification
45	45.0 N·m
80	80.0 N·m
1A	110 N·m
1E	150 N·m
2Z	200 N·m

**3rd digit** Servomotor Outer Diameter

Code	Specification
A	100-mm dia.
B	135-mm dia.
C	175-mm dia.
D	230-mm dia.
M	280-mm dia.
N	360-mm dia.

**4th digit** Serial Encoder

Code	Specification
7	24-bit multiturn absolute encoder*1
F	24-bit incremental encoder*1

**5th digit** Design Revision Order

A

**6th digit** Flange

Code	Mounting	Servomotor Outer Diameter Code (3rd Digit)					
		A	B	C	D	M	N
1	Non-load side	✓	✓	✓	✓	-	-
	Load side	-	-	-	-	✓	✓
3	Non-load side	-	-	-	-	✓	✓
4	Non-load side (with cable on side)	✓	✓	✓	✓	-	-

✓ : Applicable models.

**7th digit** Options

Code	Specification
1	Without options
2	High machine precision (runout at end of shaft and runout of shaft surface: 0.01 mm)

\*1 The encoder can be used as a single-turn absolute encoder by setting a parameter.

**Note:**

1. Direct drive servomotors are not available with holding brakes.
2. This information is provided to explain model numbers. It is not meant to imply that models are available for all combinations of codes.

## Manufactured Models

Rated Torque N·m	Servomotor Outer Diameter					
	A (100-mm dia.)	B (135-mm dia.)	C (175-mm dia.)	D (230-mm dia.)	M (280-mm dia.)	N (360-mm dia.)
2.00	SGM7F-02A	-	-	-	-	-
4.00	-	SGM7F-04B	-	-	-	-
5.00	SGM7F-05A	-	-	-	-	-
7.00	SGM7F-07A	-	-	-	-	-
8.00	-	-	SGM7F-08C	-	-	-
10.0	-	SGM7F-10B	-	-	-	-
14.0	-	SGM7F-14B	-	-	-	-
16.0	-	-	-	SGM7F-16D	-	-
17.0	-	-	SGM7F-17C	-	-	-
25.0	-	-	SGM7F-25C	-	-	-
35.0	-	-	-	SGM7F-35D	-	-

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Rated Torque N·m	Servomotor Outer Diameter					
	A (100-mm dia.)	B (135-mm dia.)	C (175-mm dia.)	D (230-mm dia.)	M (280-mm dia.)	N (360-mm dia.)
45.0	–	–	–	–	SGM7F-45M	–
80.0	–	–	–	–	SGM7F-80M	SGM7F-80N
110	–	–	–	–	SGM7F-1AM	–
150	–	–	–	–	–	SGM7F-1EN
200	–	–	–	–	–	SGM7F-2ZN

**Note:**

The above table shows combinations of the rated torque and outer diameter. The fourth through seventh digits have been omitted.

## Specifications and Ratings: Small Capacity

### Specifications

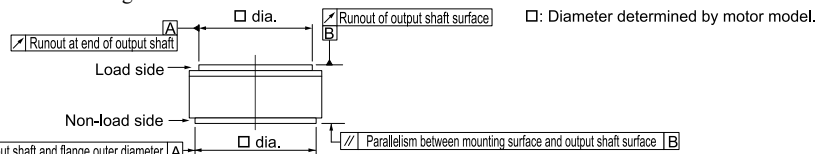
Voltage		200 V										
Model: SGM7F-		02A	05A	07A	04B	10B	14B	08C	17C	25C	16D	35D
Time Rating		Continuous										
Thermal Class		A										
Insulation Resistance		500 VDC, 10 MΩ min.										
Withstand Voltage		1500 VAC for 1 minute										
Excitation		Permanent magnet										
Mounting		Flange-mounted										
Drive Method		Direct drive										
Rotation Direction		Counterclockwise (CCW) for forward reference when viewed from the load side										
Vibration Class <sup>*1</sup>		V15										
Absolute Accuracy		±15 s										
Repeatability		±1.3 s										
Protective Structure <sup>*2</sup>		Totally enclosed, self-cooled, IP42 (The protective structure is IP40 for CE Marking.)										
Environmental Conditions	Surrounding Air Temperature	0°C to 40°C (with no freezing)										
	Surrounding Air Humidity	20% to 80% relative humidity (with no condensation)										
	Installation Site	<ul style="list-style-type: none"> <li>• Must be indoors and free of corrosive and explosive gases.</li> <li>• Must be well-ventilated and free of dust and moisture.</li> <li>• Must facilitate inspection and cleaning.</li> <li>• Must have an altitude of 1000 m or less.</li> <li>• Must be free of strong magnetic fields.</li> </ul>										
	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)										

Continued on next page.

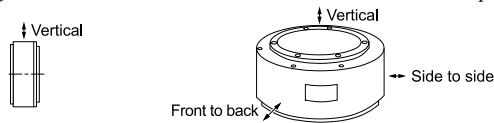
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Voltage			200 V										
Model: SGM7F-			02A	05A	07A	04B	10B	14B	08C	17C	25C	16D	35D
Mechanical Tolerances <sup>*3</sup>	Runout of Output Shaft Surface	mm	0.02 (0.01 for high machine precision option)										
	Runout at End of Output Shaft	mm	0.04 (0.01 for high machine precision option)										
	Parallelism between Mounting Surface and Output Shaft Surface	mm	0.07										
	Concentricity between Output Shaft and Flange Outer Diameter	mm	0.07										
Impact Resistance <sup>*4</sup>	Impact Acceleration at Flange		490 m/s <sup>2</sup>										
	Number of Impacts		2 times										
Vibration Resistance <sup>*4</sup>	Vibration Acceleration at Flange		49 m/s <sup>2</sup>										
Applicable SERVOPACKs	SGDXS-		2R8A				5R5A	2R8A	5R5A	7R6A	5R5A	7R6A <sup>*5</sup> , 120A	
	SGDXW-												7R6A <sup>*5</sup>

- \*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 hollow hole section, motor mounting surface, output shaft surface, and gap around the rotating part of the shaft are excluded. Protective structure specifications apply only when the special cable is used.
- \*3 Refer to the following figure for the relevant locations on the servomotor.  
Refer to the dimensional drawings of the individual servomotors for more information on tolerances.



- \*4 The given values are for when the servomotor shaft is mounted horizontally and shock 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. Check the vibration acceleration.



- \*5 Use derated values for this combination. Refer to the following section for details on the derated values.  
[Ratings on page 272](#)

## Ratings

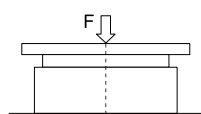
Voltage		200 V										
Model: SGM7F-		02A	05A	07A	04B	10B	14B	08C	17C	25C	16D	35D
Rated Output <sup>*1</sup>	W	63	157	220	126	314	440	251	534	785	503	1100 1000 <sup>*4</sup>
Rated Torque <sup>*1</sup> <sup>*2</sup>	N·m	2.00	5.00	7.00	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0
Instantaneous Maximum Torque <sup>*1</sup>	N·m	6.00	15.0	21.0	12.0	30.0	42.0	24.0	51.0	75.0	48.0	105
Stall Torque <sup>*1</sup>	N·m	2.00	5.00	7.00	4.00	10.0	14.0	8.00	17.0	25.0	16.0	35.0

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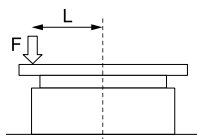
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Voltage		200 V											
Model: SGM7F-		02A	05A	07A	04B	10B	14B	08C	17C	25C	16D	35D	
Rated Current <sup>*1</sup>	Arms	1.7	1.8	2.1	2.0	2.8	4.6	2.4	4.5		5.0		
Instantaneous Maximum Current <sup>*1</sup>	Arms	5.1	5.4	6.3	6.4	8.9	14.1	8.6	14.7	13.9	16.9	16.0	
Rated Rotation Speed <sup>*1</sup>	min <sup>-1</sup>	300			300			300				300 270*5	
Maximum Rotation Speed <sup>*1</sup>	min <sup>-1</sup>	600			600			600		500	600	400	
Torque Constant	N·m/ Arms	1.28	3.01	3.64	2.21	3.81	3.27	3.52	4.04	6.04	3.35	7.33	
Rotor Moment of Inertia	×10 <sup>-4</sup> kg·m <sup>2</sup>	8.04	14.5	19.3	16.2	25.2	36.9	56.5	78.5	111	178	276	
Rated Power Rate <sup>*1</sup>	kW/s	4.98	17.2	25.4	9.88	39.7	53.1	11.3	36.8	56.3	14.4	44.4	
Rated Angular Acceleration <sup>*1</sup>	rad/s <sup>2</sup>	2490	3450	3630	2470	3970	3790	1420	2170	2250	899	1270	
Heat Sink Size	mm	300 × 300 × 12			350 × 350 × 12			450 × 450 × 12			550 × 550 × 12		
Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)	times	25	35	35	25	40	45	15	25	25	10	15	
	With external regenerative resistor	times	25	35	35	25	40	45	15	25	25	10	15
Allowable Load <sup>*3</sup>	Allowable Thrust Load	N	1100			1500			3300			4000	
	Allowable Moment Load	N·m	22	24	26	45	55	65	92	98	110	210	225

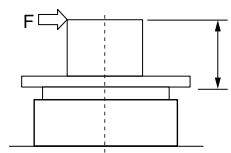
- \*1 These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. The values for other items are at 20°C. These are typical values.
- \*2 The rated torques are the continuous allowable torque values at a surrounding air temperature of 40°C with a steel heat sink of the dimensions given in the table.
- \*3 The thrust loads and moment loads that are applied while a servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = 0



Where F is the external force,  
Thrust load = F + Load mass  
Moment load = F × L



Where F is the external force,  
Thrust load = Load mass  
Moment load = F × L

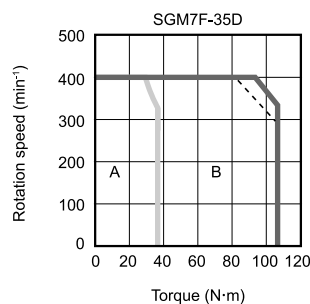
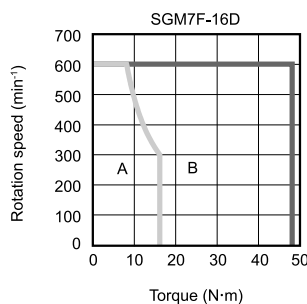
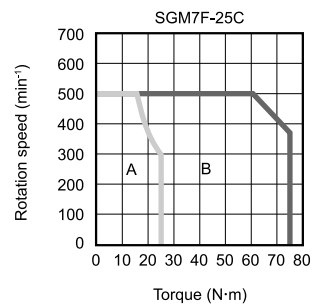
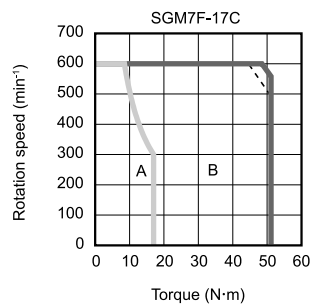
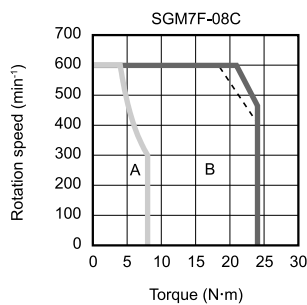
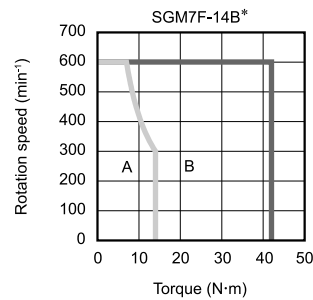
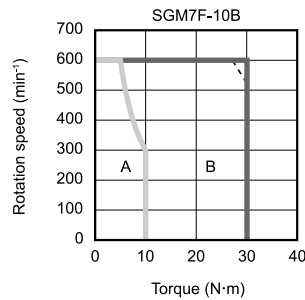
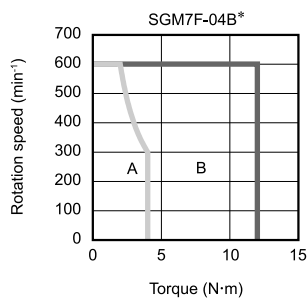
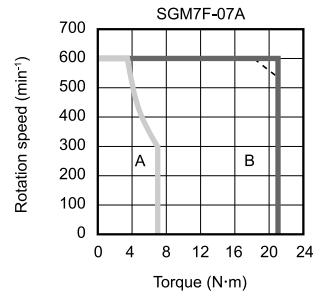
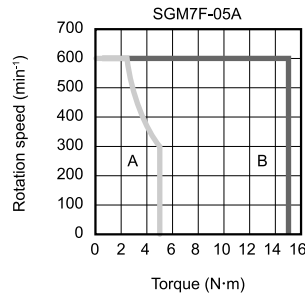
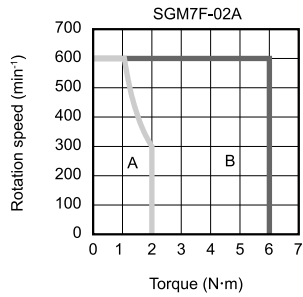
- \*4 If you use an SGDXS-7R6A SERVOPACK and SGM7E-35D servomotor together, use this value (a derated value).

**Note:**

For the bearings used in these servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

## Torque-Motor Speed Characteristics

**A** : Continuous duty zone ——— (solid lines): With three-phase 200-V or single-phase 230-V input  
**B** : Intermittent duty zone - - - - - (dotted lines): With single-phase 200-V input



\*1 The characteristics are the same for a three-phase 200-VAC input and single-phase 200-VAC input.

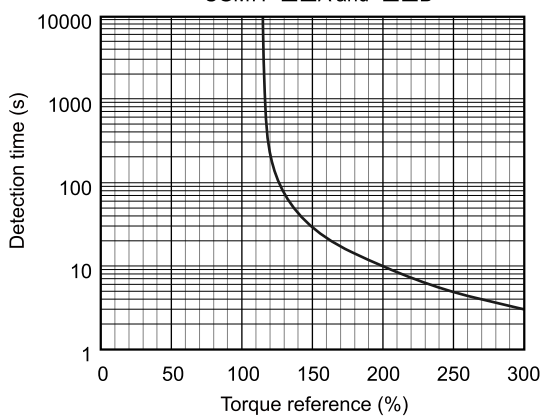
**Note:**

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 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.

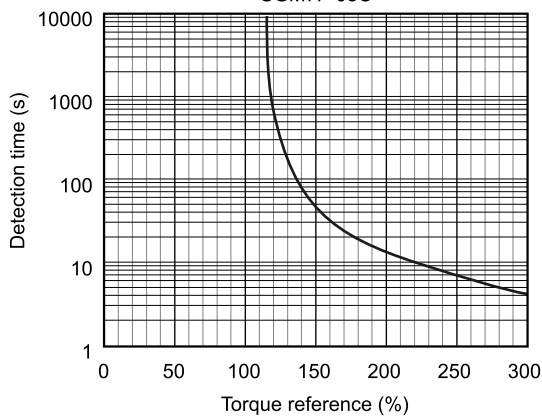
## Servomotor Overload Protection Characteristics

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

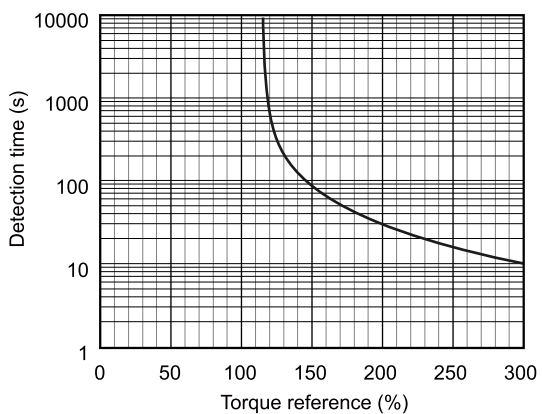
SGM7F-□□A and -□□B



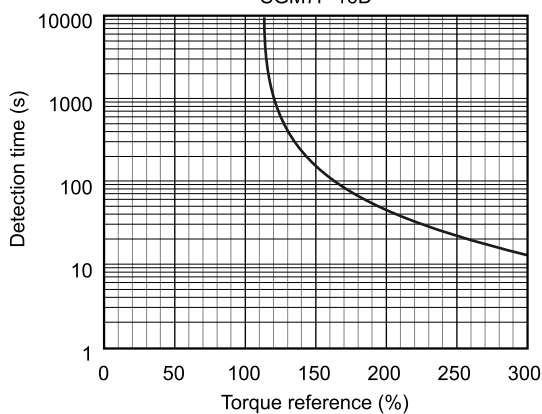
SGM7F-08C



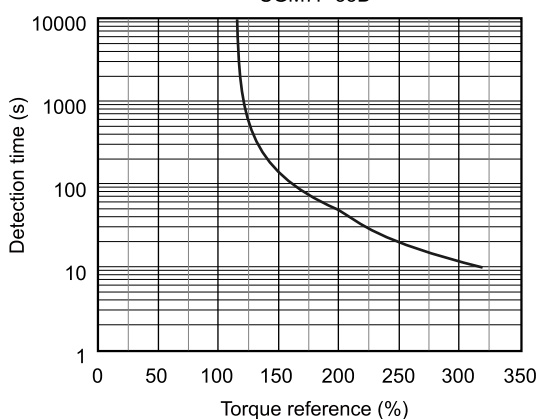
SGM7F-17C and -25C



SGM7F-16D




SGM7F-35D



**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. Refer to the following section for details on the effective torque.

 [Torque-Motor Speed Characteristics on page 274](#)

## Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the servomotors are given in "[Ratings on page 272](#)". 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 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.

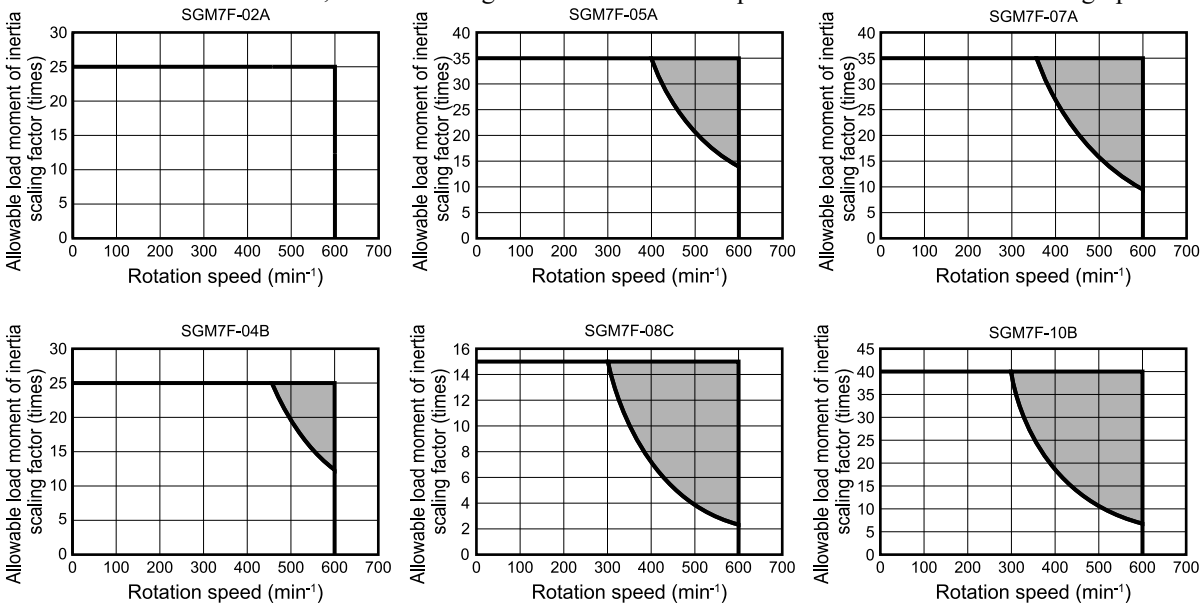
**Information** An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Install an external regenerative resistor when the built-in regenerative resistor cannot process all of the regenerative power.

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](#)

### ■ 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, an external regenerative resistor is required in the shaded areas of the graphs.



**Note:**

Applicable SERVOPACK Model: SGDXS-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 information on the external regenerative resistors.

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

## Specifications and Ratings: Medium Capacity

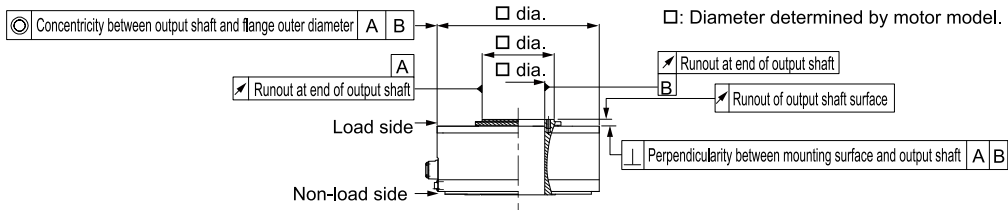
### Specifications

Voltage		200 V					
Model: SGM7F-		45M	80M	1AM	80N	1EN	2ZN
Time Rating		Continuous					
Thermal Class		F					
Insulation Resistance		500 VDC, 10 MΩ min.					
Withstand Voltage		1500 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					
Absolute Accuracy		±15 s					
Repeatability		±1.3 s					
Protective Structure *2		Totally enclosed, self-cooled, IP44 (The protective structure is IP40 for CE Marking.)					
Environmental Conditions	Surrounding Air Temperature		0°C to 40°C (with no freezing)				
	Surrounding Air Humidity		20% to 80% relative humidity (with no condensation)				
	Installation Site		<ul style="list-style-type: none"> <li>• Must be indoors and free of corrosive and explosive gases.</li> <li>• Must be well-ventilated and free of dust and moisture.</li> <li>• Must facilitate inspection and cleaning.</li> <li>• Must have an altitude of 1000 m or less.</li> <li>• Must be free of strong magnetic fields.</li> </ul>				
	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)				
Mechanical Tolerances *3	Runout of Output Shaft Surface	mm	0.02 (0.01 for high machine precision option)				
	Runout at End of Output Shaft	mm	0.04 (0.01 for high machine precision option)				
	Parallelism between Mounting Surface and Output Shaft Surface	mm	-				
	Concentricity between Output Shaft and Flange Outer Diameter	mm	0.08				
	Perpendicularity between Mounting Surface and Output Shaft	mm	0.08				
Impact Resistance *4	Impact Acceleration at Flange		490 m/s <sup>2</sup>				
	Number of Impacts		2 times				
Vibration Resistance *4	Vibration Acceleration at Flange		24.5 m/s <sup>2</sup>				
Applicable SERVOPACKs	SGDXS-		7R6A	120A	180A	120A	200A
	SGDXW-		7R6A	-			

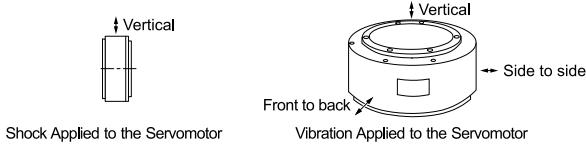
\*1 A vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the servomotor without a load at the rated rotation speed.

\*2 This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.

\*3 Refer to the following figure for the relevant locations on the servomotor. Refer to the dimensional drawings of the individual servomotors for more information on tolerances.



\*4 The given values are for when the servomotor shaft is mounted horizontally and shock 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. Check the vibration acceleration.



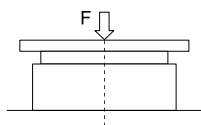
## Ratings

Voltage		200 V					
Model: SGM7F-		45M	80M	1AM	80N	1EN	22N
Rated Output *1	W	707	1260	1730	1260	2360	3140
Rated Torque *1 *2	N·m	45.0	80.0	110	80.0	150	200
Instantaneous Maximum Torque *1	N·m	135	240	330	240	450	600
Stall Torque *1	N·m	45.0	80.0	110	80.0	150	200
Rated Current *1	Arms	5.8	9.7	13.4	9.4	17.4	18.9
Instantaneous Maximum Current *1	Arms	17.0	28.0	42.0	28.0	56.0	56.0
Rated Rotation Speed *1	min <sup>-1</sup>	150			150		
Maximum Rotation Speed *1	min <sup>-1</sup>	300			300	250	
Torque Constant	N·m/Arms	8.39	8.91	8.45	9.08	9.05	11.5
Rotor Moment of Inertia	×10 <sup>-4</sup> kg·m <sup>2</sup>	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 <sup>2</sup>	1160	1280	1270	588	607	654
Heat Sink Size	mm	750 × 750 × 45					
Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)		3 times					
With external regenerative resistor and dynamic brake resistor		3 times					
Allowable Load *3	A	mm	33			37.5	
	Allowable Thrust Load	N	9000			16000	
	Allowable Moment Load	N·m	180			350	

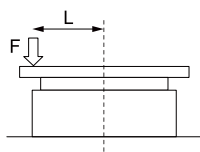
\*1 These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C. These are typical values.

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

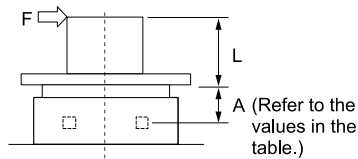
\*3 The thrust loads and moment loads that are applied while a servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.



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



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



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

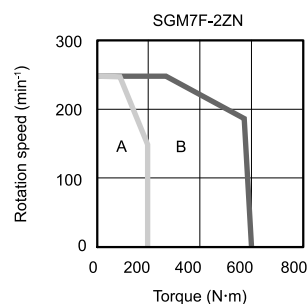
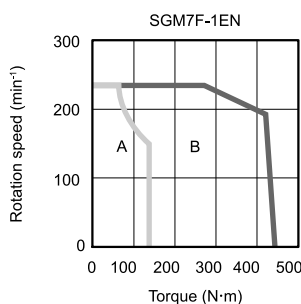
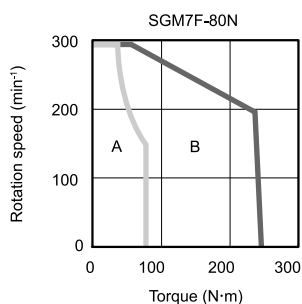
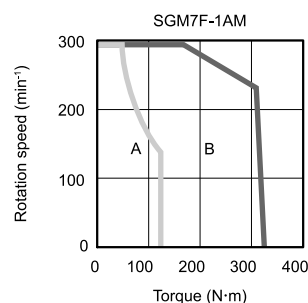
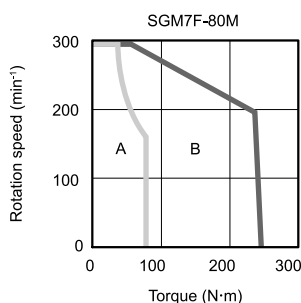
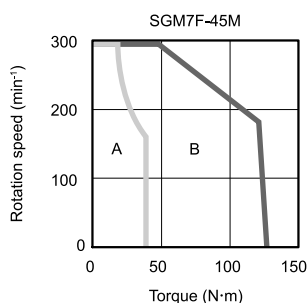
**Note:**

For the bearings used in these servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.

## Torque-Motor Speed Characteristics

**A** : Continuous duty zone

**B** : Intermittent duty zone

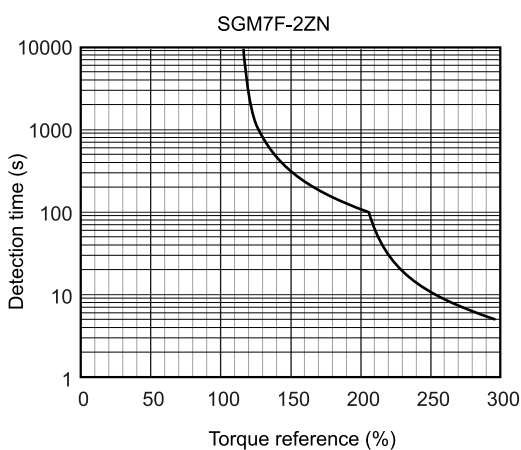
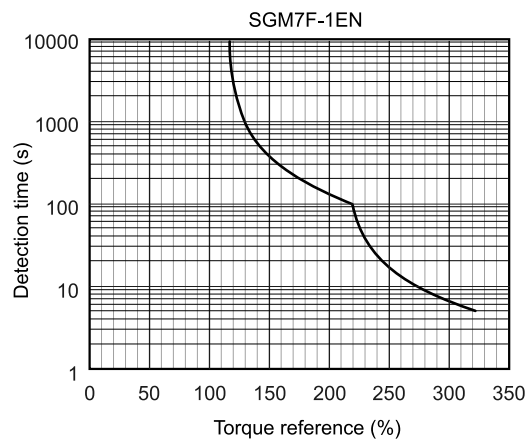
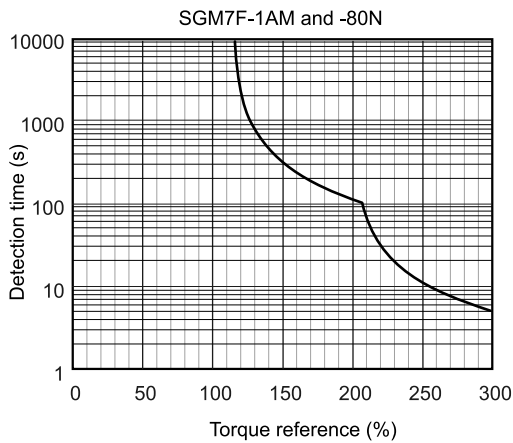
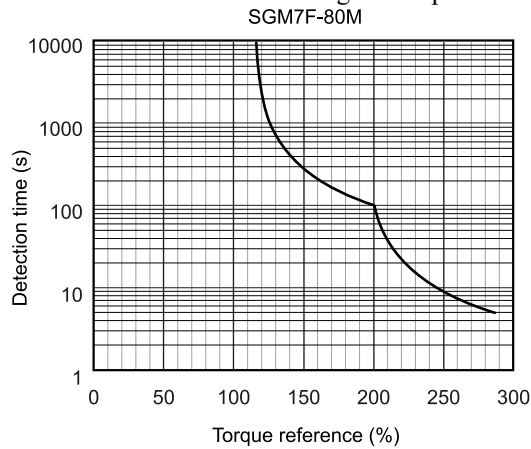
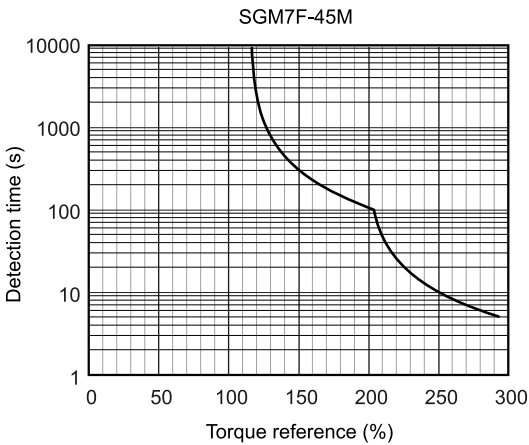


**Note:**

1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 20°C.
2. If the effective torque is within the allowable range for the rated torque, the servomotor can be used within the intermittent duty zone.
3. 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 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 force remains within the continuous duty zone given in [Torque-Motor Speed Characteristics on page 279](#).

## Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the servomotors are given in "[Ratings on page 278](#)". 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 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). Install an external regenerative resistor when the built-in regenerative resistor cannot process all of the regenerative power.

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](#)

### ■ 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+.

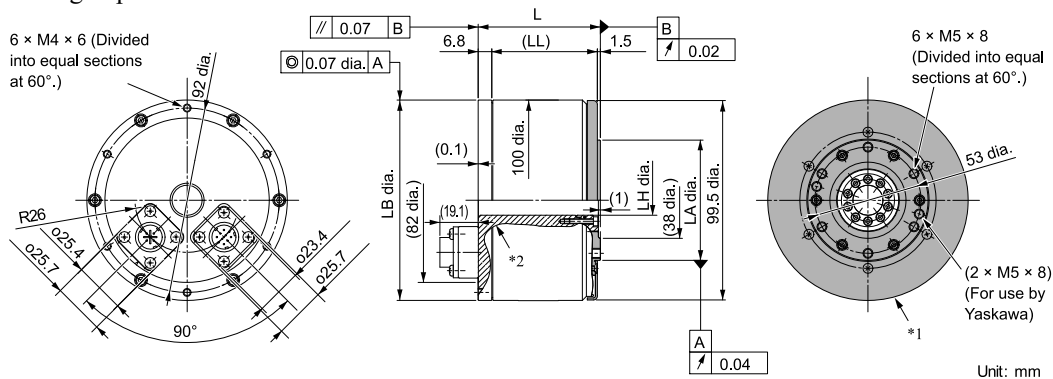
Refer to the following section for information on the external regenerative resistors.

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

## External Dimensions

### SGM7F-□□A

#### · Flange Specification 1



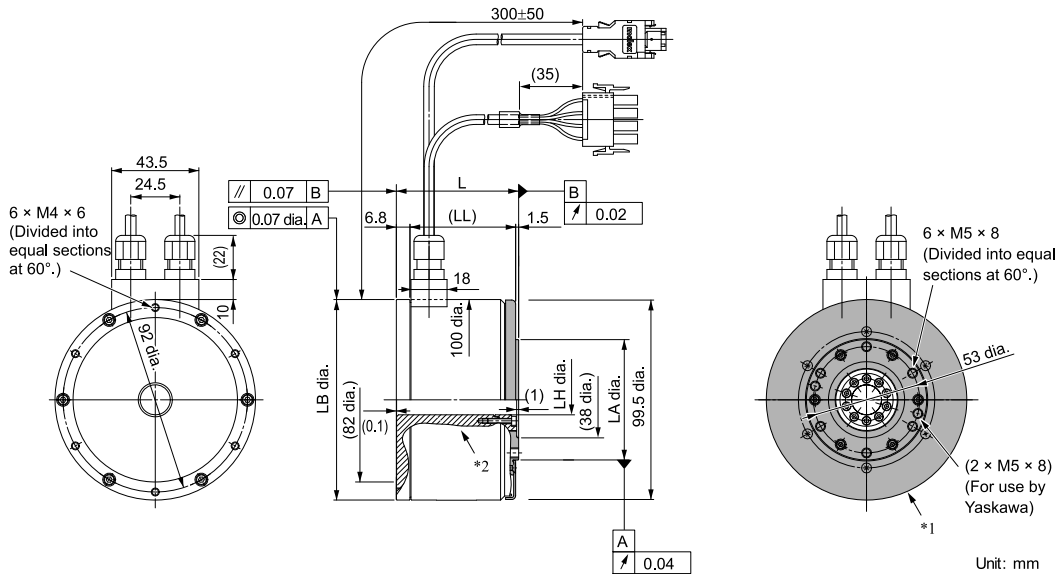
- \*1 The shaded section indicates the rotating parts.  
\*2 The hatched section indicates the non-rotating parts.

**Note:**

Values in parentheses are reference dimensions.

Model: SGM7F-	L	(LL)	LB	LH	LA	Approx. mass [kg]
02A□A11	61	(52.7)	100 <sup>0</sup> <sub>-0.035</sub>	15 <sup>+0.4</sup> <sub>0</sub>	60 <sup>0</sup> <sub>-0.030</sub>	2.5
05A□A11	96	(87.7)	100 <sup>0</sup> <sub>-0.035</sub>	15 <sup>+0.4</sup> <sub>0</sub>	60 <sup>0</sup> <sub>-0.030</sub>	4.5
07A□A11	122	(113.7)	100 <sup>0</sup> <sub>-0.035</sub>	15 <sup>+0.4</sup> <sub>0</sub>	60 <sup>0</sup> <sub>-0.030</sub>	5.5

#### · Flange Specification 4



- \*1 The shaded section indicates the rotating parts.
- \*2 The hatched section indicates the non-rotating parts.

**Note:**

Values in parentheses are reference dimensions.

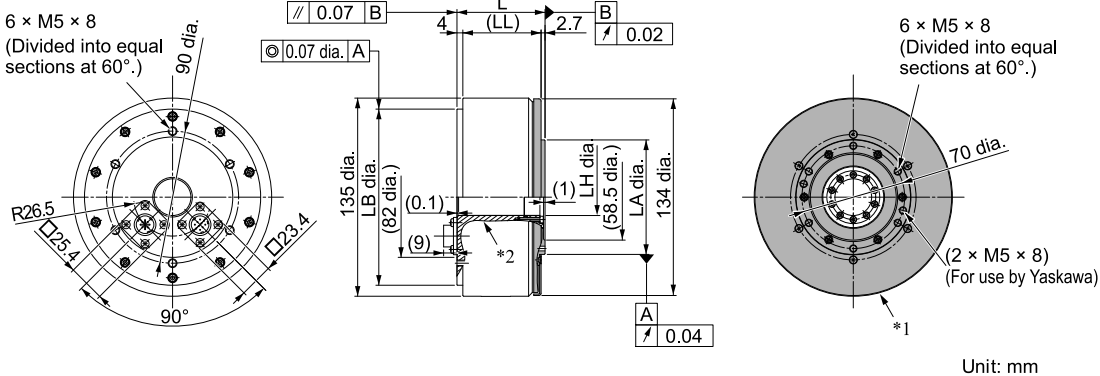
Model: SGM7F-	L	(LL)	LB	LH	LA	Approx. mass [kg]
02A□A41	61	(52.7)	100 <sup>0</sup> <sub>-0.035</sub>	15 <sup>+0.4</sup> <sub>0</sub>	60 <sup>0</sup> <sub>-0.030</sub>	2.5
05A□A41	96	(87.7)	100 <sup>0</sup> <sub>-0.035</sub>	15 <sup>+0.4</sup> <sub>0</sub>	60 <sup>0</sup> <sub>-0.030</sub>	4.5
07A□A41	122	(113.7)	100 <sup>0</sup> <sub>-0.035</sub>	15 <sup>+0.4</sup> <sub>0</sub>	60 <sup>0</sup> <sub>-0.030</sub>	5.5

Refer to the following section for information on connector models.

[Connector Specifications on page 289](#)

## SGM7F-□□B

### · Flange Specification 1



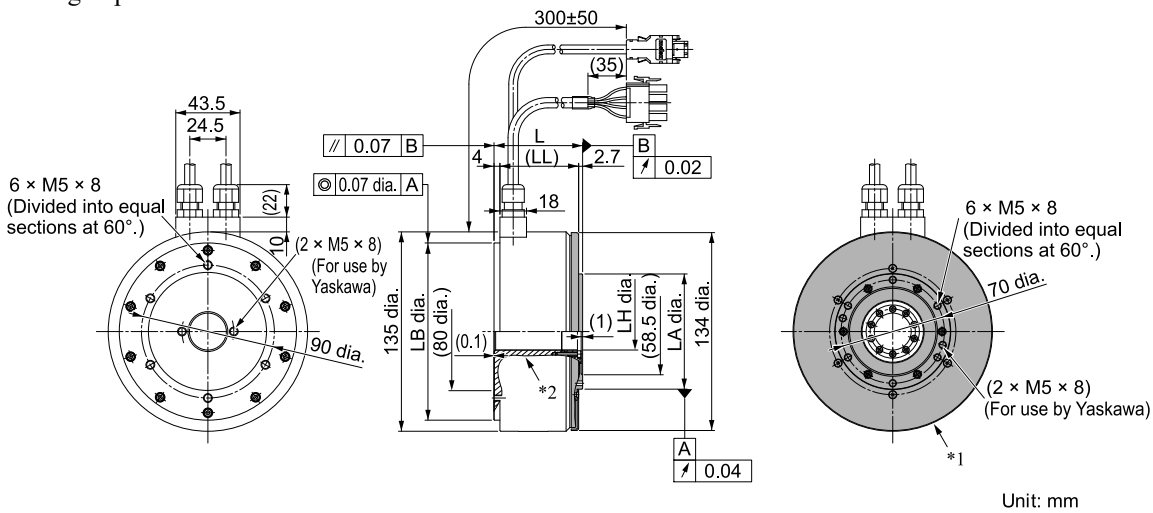
- \*1 The shaded section indicates the rotating parts.
- \*2 The hatched section indicates the non-rotating parts.

**Note:**

Values in parentheses are reference dimensions.

Model: SGM7F-	L	(LL)	LB	LH	LA	Approx. mass [kg]
04B□A11	60	53.3	120 <sup>0</sup> <sub>-0.035</sub>	25 <sup>+0.3</sup> <sub>+0.1</sub>	78 <sup>0</sup> <sub>-0.030</sub>	5.0
10B□A11	85	78.3	120 <sup>0</sup> <sub>-0.035</sub>	25 <sup>+0.3</sup> <sub>+0.1</sub>	78 <sup>0</sup> <sub>-0.030</sub>	6.5
14B□A11	115	108.3	120 <sup>0</sup> <sub>-0.035</sub>	25 <sup>+0.3</sup> <sub>+0.1</sub>	78 <sup>0</sup> <sub>-0.030</sub>	9.0

· Flange Specification 4



- \*1 The shaded section indicates the rotating parts.
- \*2 The hatched section indicates the non-rotating parts.

**Note:**

Values in parentheses are reference dimensions.

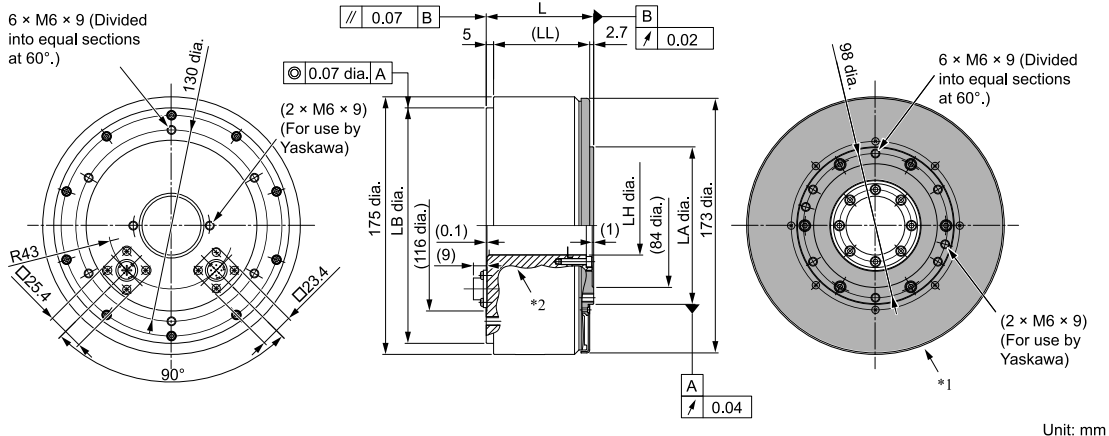
Model: SGM7F-	L	(LL)	LB	LH	LA	Approx. mass [kg]
04B□A41	60	53.3	120 <sup>0</sup> <sub>-0.035</sub>	25 <sup>+0.3</sup> <sub>+0.1</sub>	78 <sup>0</sup> <sub>-0.030</sub>	5.0
10B□A41	85	78.3	120 <sup>0</sup> <sub>-0.035</sub>	25 <sup>+0.3</sup> <sub>+0.1</sub>	78 <sup>0</sup> <sub>-0.030</sub>	6.5
14B□A41	115	108.3	120 <sup>0</sup> <sub>-0.035</sub>	25 <sup>+0.3</sup> <sub>+0.1</sub>	78 <sup>0</sup> <sub>-0.030</sub>	9.0

Refer to the following section for information on connector models.

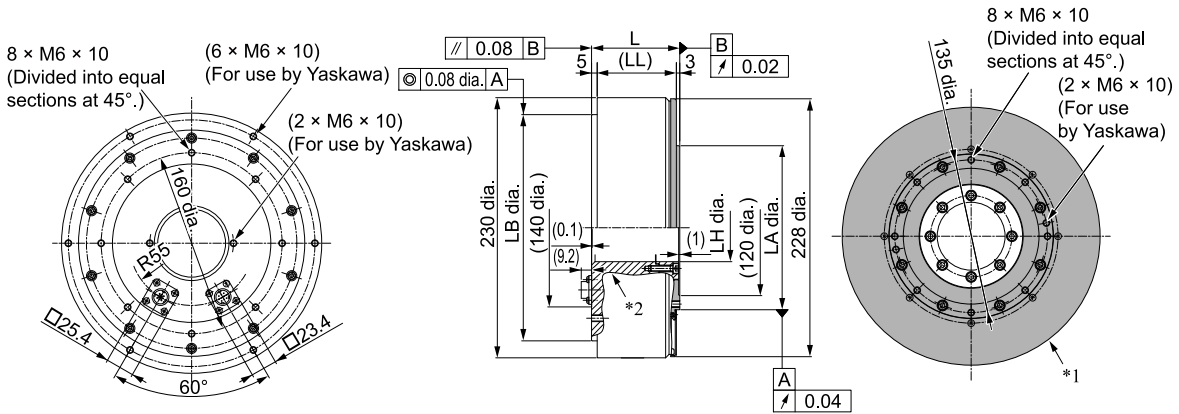
[Connector Specifications on page 289](#)

## SGM7F-□□□C

· Flange Specification 1







Unit: mm

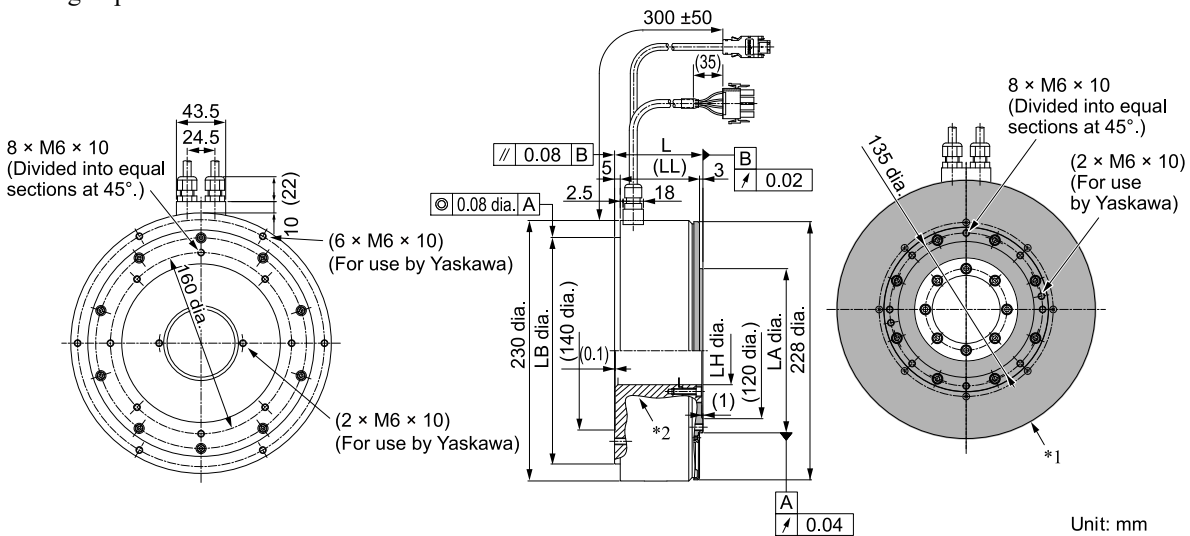
- \*1 The shaded section indicates the rotating parts.
- \*2 The hatched section indicates the non-rotating parts.

**Note:**

Values in parentheses are reference dimensions.

Model: SGM7F-	L	(LL)	LB	LH	LA	Approx. mass [kg]
16D□A11	78	70	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	145 <sup>0</sup> <sub>-0.040</sub>	16.0
35D□A11	107	99	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	145 <sup>0</sup> <sub>-0.040</sub>	25.0

· Flange Specification 4



Unit: mm

- \*1 The shaded section indicates the rotating parts.
- \*2 The hatched section indicates the non-rotating parts.

**Note:**

Values in parentheses are reference dimensions.

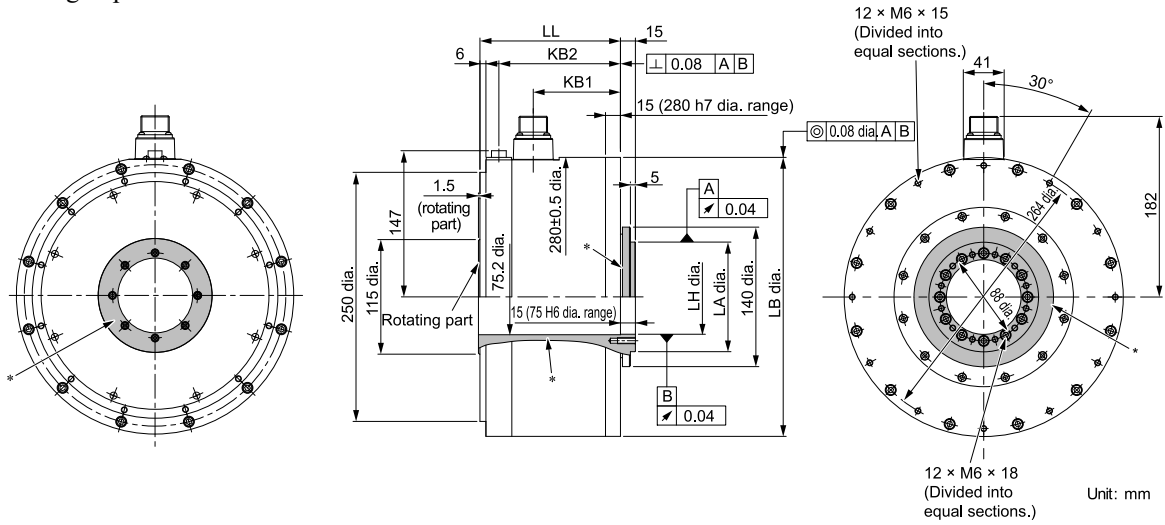
Model: SGM7F-	L	(LL)	LB	LH	LA	Approx. mass [kg]
16D□A41	78	70	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	145 <sup>0</sup> <sub>-0.040</sub>	16.0
35D□A41	107	99	200 <sup>0</sup> <sub>-0.046</sub>	60 <sup>+0.4</sup> <sub>0</sub>	145 <sup>0</sup> <sub>-0.040</sub>	25.0

Refer to the following section for information on connector models.

[Connector Specifications on page 289](#)

## SGM7F-□□M

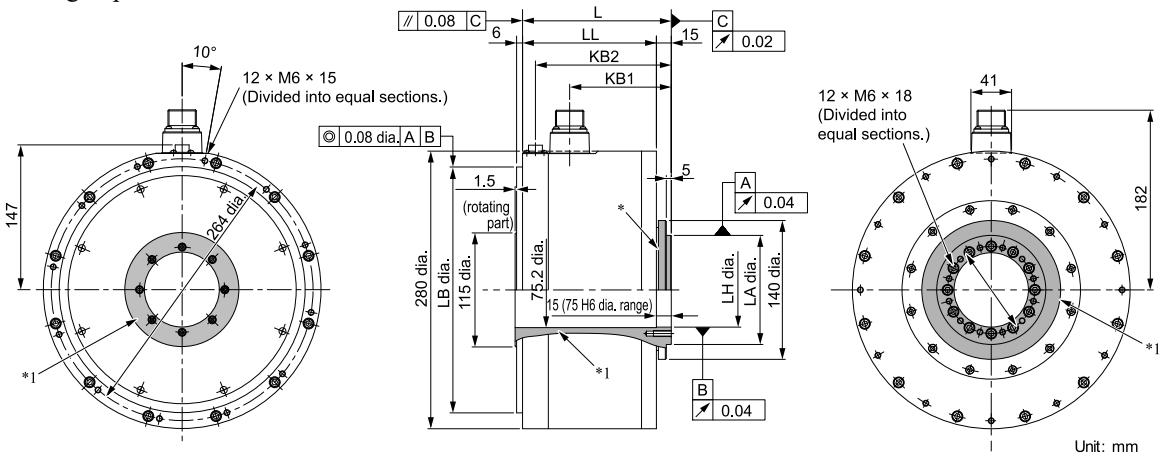
### · Flange Specification 1



\*1 The shaded section indicates the rotating parts.

Model: SGM7F-	LL	KB1	KB2	LB	LH	LA	Approx. mass [kg]
45M□A11	141	87.5	122	280 <sup>0</sup> <sub>-0.052</sub>	75 <sup>+0.019</sup> <sub>0</sub>	110 <sup>0</sup> <sub>-0.035</sub>	38
80M□A11	191	137.5	172	280 <sup>0</sup> <sub>-0.052</sub>	75 <sup>+0.019</sup> <sub>0</sub>	110 <sup>0</sup> <sub>-0.035</sub>	45
1AM□A11	241	187.5	222	280 <sup>0</sup> <sub>-0.052</sub>	75 <sup>+0.019</sup> <sub>0</sub>	110 <sup>0</sup> <sub>-0.035</sub>	51

### · Flange Specification 3



\*1 The shaded section indicates the rotating parts.

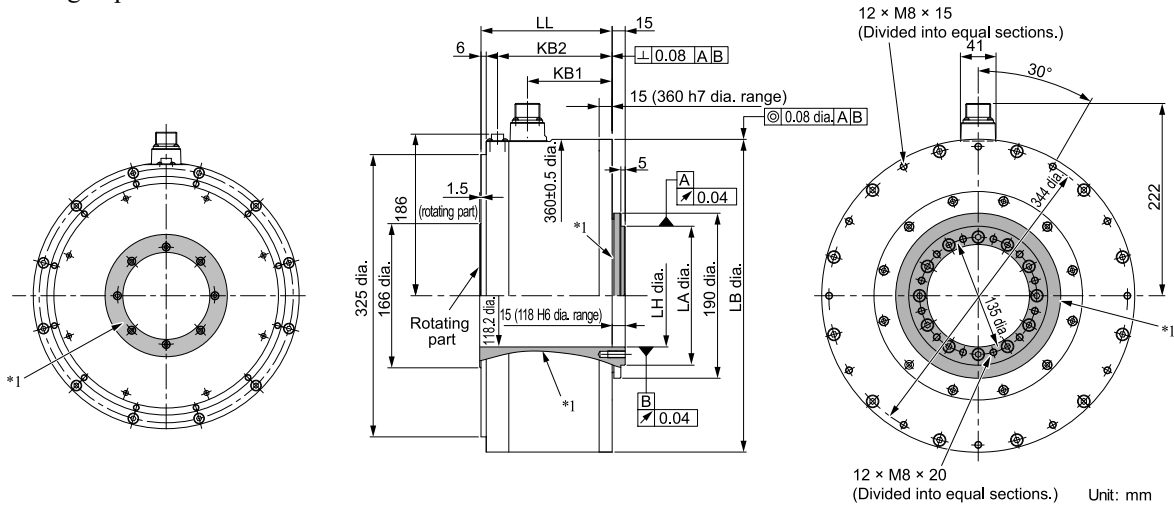
Model: SGM7F-	L	LL	KB1	KB2	LB	LH	LR	Approx. mass [kg]
45M□A31	150	135	102.5	137	248 <sup>0</sup> <sub>-0.046</sub>	75 <sup>+0.019</sup> <sub>0</sub>	110 <sup>0</sup> <sub>-0.035</sub>	38
80M□A31	200	185	152.5	187	248 <sup>0</sup> <sub>-0.046</sub>	75 <sup>+0.019</sup> <sub>0</sub>	110 <sup>0</sup> <sub>-0.035</sub>	45
1AM□A31	250	235	202.5	237	248 <sup>0</sup> <sub>-0.046</sub>	75 <sup>+0.019</sup> <sub>0</sub>	110 <sup>0</sup> <sub>-0.035</sub>	51

Refer to the following section for information on connector models.

[Connector Specifications on page 289](#)

# SGM7F-□□N

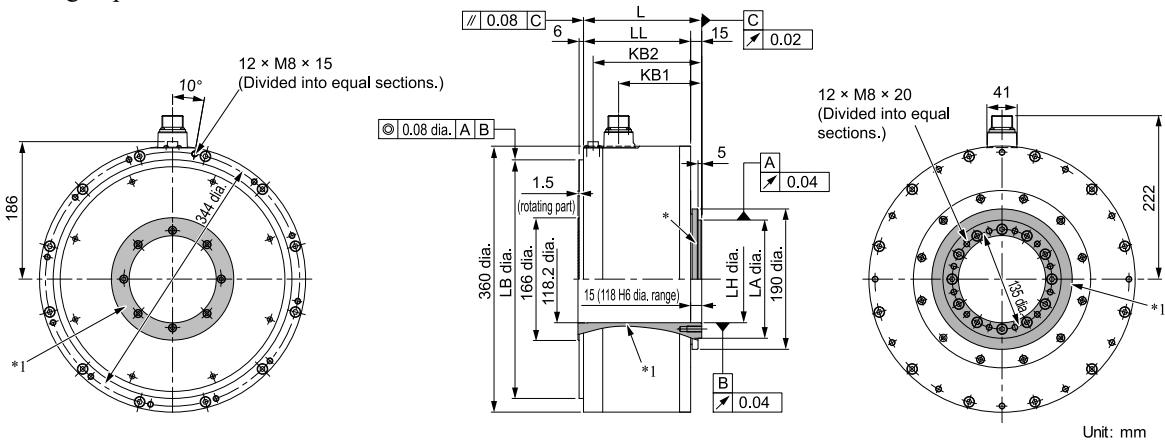
## · Flange Specification 1



\*1 The shaded section indicates the rotating parts.

Model: SGM7F-	LL	KB1	KB2	LB	LH	LA	Approx. mass [kg]
80N□A11	151	98	132	360 <sup>0</sup> <sub>-0.057</sub>	118 <sup>+0.022</sup> <sub>0</sub>	160 <sup>0</sup> <sub>-0.040</sub>	50
1EN□A11	201	148	182	360 <sup>0</sup> <sub>-0.057</sub>	118 <sup>+0.022</sup> <sub>0</sub>	160 <sup>0</sup> <sub>-0.040</sub>	68
2ZN□A11	251	198	232	360 <sup>0</sup> <sub>-0.057</sub>	118 <sup>+0.022</sup> <sub>0</sub>	160 <sup>0</sup> <sub>-0.040</sub>	86

· Flange Specification 3



\*1 The shaded section indicates the rotating parts.

Model: SGM7F-	L	LL	KB1	KB2	LB	LH	LA	Approx. mass [kg]
80N□A31	160	145	113	147	323 <sup>0</sup> <sub>-0.057</sub>	118 <sup>+0.022</sup> <sub>0</sub>	160 <sup>0</sup> <sub>-0.040</sub>	50
1EN□A31	210	195	163	197	323 <sup>0</sup> <sub>-0.057</sub>	118 <sup>+0.022</sup> <sub>0</sub>	160 <sup>0</sup> <sub>-0.040</sub>	68
2ZN□A31	260	245	213	247	323 <sup>0</sup> <sub>-0.057</sub>	118 <sup>+0.022</sup> <sub>0</sub>	160 <sup>0</sup> <sub>-0.040</sub>	86

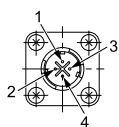
Refer to the following section for information on connector models.

☞ [Connector Specifications on page 289](#)

## Connector Specifications

### SGM7F-□□A, -□□B, -□□C, or -□□D: Flange Specification 1

· Servomotor Connector



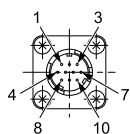
1	Phase U
2	Phase V
3	Phase W
4	FG (frame ground)

Model: JN1AS04MK2R

Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS04FK1 (Not provided by Yaskawa.)

· Encoder Connector



1	PS
2	/PS
3	—
4	PG5V
5 *1	BAT0
6	—
7	FG (frame ground)
8 *1	BAT
9	PG0V
10	—

\*1 A battery is required only for a multiturn absolute encoder.

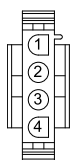
Model: JN1AS10ML1-R

Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1 (Not provided by Yaskawa.)

### SGM7F-□□A, -□□B, -□□C, or -□□D: Flange Specification 4

· Servomotor Connector



1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Model

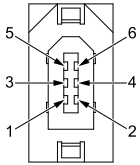
- Plug: 350779-1
- Pins: 350561-3 or 350690-3 (No.1 to 3)
- Ground pin: 350654-1 or 350669-1 (No. 4)

Manufacturer: Tyco Electronics Japan G.K.

Mating Connector

- Cap: 350780-1
- Socket: 350570-3 or 350689-3

· Encoder Connector



1	PG5V
2	PG0V
3 *1	BAT
4 *1	BAT0
5	PS
6	/PS
<b>Connector case</b>	FG (frame ground)

\*1 A battery is required only for a multiturn absolute encoder.

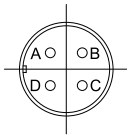
Model: 55102-0600

Manufacturer: Molex Japan LLC

Mating connector: 54280-0609

### SGM7F-□□M, -□□N: Flange Specification 1, 3

· Servomotor Connector



A	Phase U
B	Phase V
C	Phase W
D	FG (frame ground)

Model: CE05-2A18-10PD

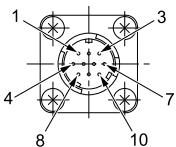
Manufacturer: DDK Ltd.

Mating Connector

Plug: CE05-6A18-10SD-D-BSS

Cable clamp: CE3057-10A-□(D265)

· Encoder Connector



1	PS
2	/PS
3	-
4	PG5V
5 *1	BAT0
6	-
7	FG (frame ground)
8 *1	BAT
9	PG0V
10	-

\*1 A battery is required only for a multiturn absolute encoder.

Model: JN1AS10ML1

Manufacturer: Japan Aviation Electronics Industry, Ltd.

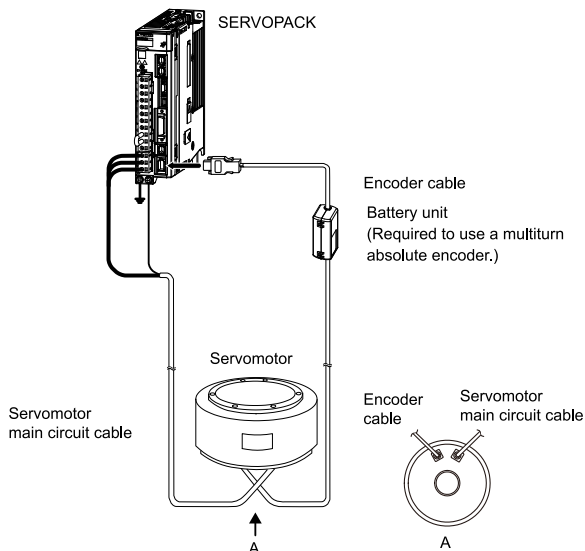
Mating connector: JN1DS10SL1 (Not provided by Yaskawa.)

## Selecting Cables

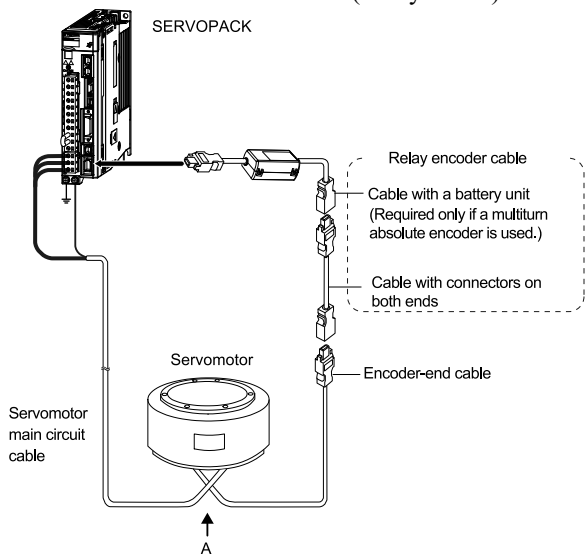
### Cable Configurations

The cables shown below are required to connect a servomotor to a SERVOPACK.

#### Encoder Cables of 20 m or Less



#### Encoder Cable of 30 m to 50 m (Relay Cable)

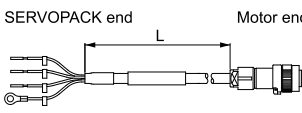
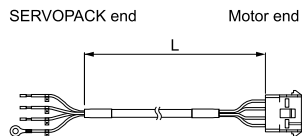
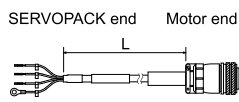
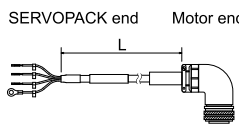
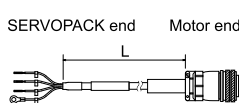
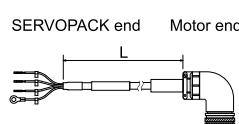


#### Note:

1. If the encoder cable length exceeds 20 m, use a relay encoder cable.
2. 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.
3. Refer to the following manual for the following information.
  - Cable dimensional drawings and cable connection specifications
  - Order numbers and specifications of individual connectors for cables
  - Order numbers and specifications for wiring materials

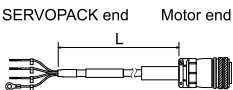
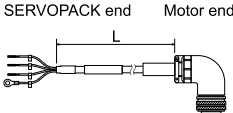
☞  $\Sigma$ -X-Series Peripheral Device Selection Manual (Manual No.: SIEP C710812 12)

## Servomotor Main Circuit Cables

Servomotor Model	Length (L)	Order Number		Appearance
		Standard Cable	Flexible Cable <sup>*1</sup>	
SGM7F-□□A SGM7F-□□B SGM7F-□□C SGM7F-□□D Flange Specification <sup>*2</sup> : 1	3 m	JZSP-CMM60-03-E	JZSP-C7MDN23-03-E	
	5 m	JZSP-CMM60-05-E	JZSP-C7MDN23-05-E	
	10 m	JZSP-CMM60-10-E	JZSP-C7MDN23-10-E	
	15 m	JZSP-CMM60-15-E	JZSP-C7MDN23-15-E	
	20 m	JZSP-CMM60-20-E	JZSP-C7MDN23-20-E	
SGM7F-□□A SGM7F-□□B SGM7F-□□C SGM7F-□□D Flange Specification <sup>*2</sup> : 4	3 m	JZSP-CMM00-03-E	JZSP-C7MDS23-03-E	
	5 m	JZSP-CMM00-05-E	JZSP-C7MDS23-05-E	
	10 m	JZSP-CMM00-10-E	JZSP-C7MDS23-10-E	
	15 m	JZSP-CMM00-15-E	JZSP-C7MDS23-15-E	
	20 m	JZSP-CMM00-20-E	JZSP-C7MDS23-20-E	
SGM7F-□□M SGM7F-□□N □□ : 45 □□ : 80	3 m	JZSP-USA101-03-E	JZSP-USA121-03-E	
	5 m	JZSP-USA101-05-E	JZSP-USA121-05-E	
	10 m	JZSP-USA101-10-E	JZSP-USA121-10-E	
	15 m	JZSP-USA101-15-E	JZSP-USA121-15-E	
	20 m	JZSP-USA101-20-E	JZSP-USA121-20-E	
	3 m	JZSP-USA102-03-E	JZSP-USA122-03-E	
	5 m	JZSP-USA102-05-E	JZSP-USA122-05-E	
	10 m	JZSP-USA102-10-E	JZSP-USA122-10-E	
	15 m	JZSP-USA102-15-E	JZSP-USA122-15-E	
	20 m	JZSP-USA102-20-E	JZSP-USA122-20-E	
SGM7F-□□M SGM7F-□□N □□ : 1A	3 m	JZSP-USA301-03-E	JZSP-USA321-03-E	
	5 m	JZSP-USA301-05-E	JZSP-USA321-05-E	
	10 m	JZSP-USA301-10-E	JZSP-USA321-10-E	
	15 m	JZSP-USA301-15-E	JZSP-USA321-15-E	
	20 m	JZSP-USA301-20-E	JZSP-USA321-20-E	
	3 m	JZSP-USA302-03-E	JZSP-USA322-03-E	
	5 m	JZSP-USA302-05-E	JZSP-USA322-05-E	
	10 m	JZSP-USA302-10-E	JZSP-USA322-10-E	
	15 m	JZSP-USA302-15-E	JZSP-USA322-15-E	
	20 m	JZSP-USA302-20-E	JZSP-USA322-20-E	


Continued on next page.

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Servomotor Model	Length (L)	Order Number		Appearance
		Standard Cable	Flexible Cable *1	
SGM7F-□□M SGM7F-□□N □□ : 1E □□ : 2Z	3 m	JZSP-USA501-03-E	JZSP-USA521-03-E	
	5 m	JZSP-USA501-05-E	JZSP-USA521-05-E	
	10 m	JZSP-USA501-10-E	JZSP-USA521-10-E	
	15 m	JZSP-USA501-15-E	JZSP-USA521-15-E	
	20 m	JZSP-USA501-20-E	JZSP-USA521-20-E	
	3 m	JZSP-USA502-03-E	JZSP-USA522-03-E	
	5 m	JZSP-USA502-05-E	JZSP-USA522-05-E	
	10 m	JZSP-USA502-10-E	JZSP-USA522-10-E	
	15 m	JZSP-USA502-15-E	JZSP-USA522-15-E	
	20 m	JZSP-USA502-20-E	JZSP-USA522-20-E	

\*1 Use flexible cables for moving parts of machines, such as robots. The recommended bending radius of the flexible cables are given in the following table.

\*2 Refer to the following section for flange specifications.

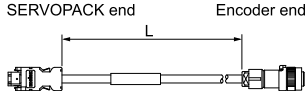
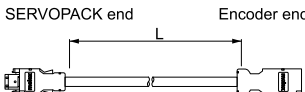
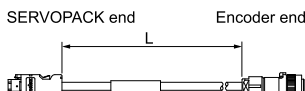
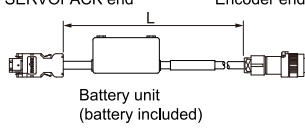
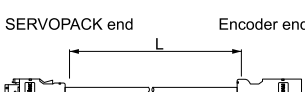
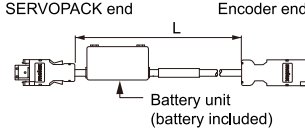
 [Model Designations on page 270](#)

Order Number	Recommended Bending Radius (R)	Order Number	Recommended Bending Radius (R)
JZSP-C7MDN23-□□-E	90 mm min.	JZSP-USA321-□□-E	113 mm min.
JZSP-C7MDS23-□□-E		JZSP-USA322-□□-E	
JZSP-USA121-□□-E	96 mm min.	JZSP-USA521-□□-E	150 mm min.
JZSP-USA122-□□-E		JZSP-USA522-□□-E	

**Note:**


Direct drive servomotors are not available with holding brakes.

## Encoder Cables of 20 m or Less

Servomotor Model	Name	Length (L)	Order Number		Appearance
			Standard Cable	Flexible Cable <sup>*1</sup>	
SGM7F-□□□F Flange Specification <sup>*2</sup> : 1 or 3	For incremental encoder	3 m	JZSP-CMP60-03-E	JZSP-CSP60-03-E	
		5 m	JZSP-CMP60-05-E	JZSP-CSP60-05-E	
		10 m	JZSP-CMP60-10-E	JZSP-CSP60-10-E	
		15 m	JZSP-CMP60-15-E	JZSP-CSP60-15-E	
		20 m	JZSP-CMP60-20-E	JZSP-CSP60-20-E	
SGM7F-□□□AF SGM7F-□□□BF SGM7F-□□□CF SGM7F-□□□DF Flange Specification <sup>*2</sup> : 4		3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	
		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
SGM7F-□□□7 Flange Specification <sup>*2</sup> : 1 or 3	For multiturn absolute encoder (without battery unit) <sup>*3</sup>	3 m	JZSP-C7PI00-03-E	JZSP-C7PI20-03-E	
		5 m	JZSP-C7PI00-05-E	JZSP-C7PI20-05-E	
		10 m	JZSP-C7PI00-10-E	JZSP-C7PI20-10-E	
		15 m	JZSP-C7PI00-15-E	JZSP-C7PI20-15-E	
		20 m	JZSP-C7PI00-20-E	JZSP-C7PI20-20-E	
	For multiturn absolute encoder (with battery unit)	3 m	JZSP-C7PA00-03-E	JZSP-C7PA20-03-E	
		5 m	JZSP-C7PA00-05-E	JZSP-C7PA20-05-E	
		10 m	JZSP-C7PA00-10-E	JZSP-C7PA20-10-E	
		15 m	JZSP-C7PA00-15-E	JZSP-C7PA20-15-E	
		20 m	JZSP-C7PA00-20-E	JZSP-C7PA20-20-E	
SGM7F-□□□A7 SGM7F-□□□B7 SGM7F-□□□C7 SGM7F-□□□D7 Flange Specification <sup>*2</sup> : 4	For multiturn absolute encoder (without battery unit) <sup>*3</sup>	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	
		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E	
		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E	
		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E	
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E	
	For multiturn absolute encoder (with battery unit)	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E	
		5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E	
		10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E	
		15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E	
		20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E	

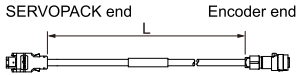
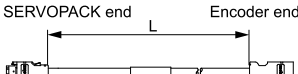
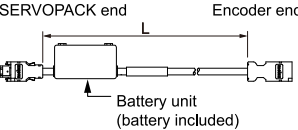
\*1 Use flexible cables for moving parts of machines, such as robots. The recommended bending radius (R) is 46 mm or larger.

\*2 Refer to the following section for flange specifications.

 [Model Designations on page 270](#)


\*3 Use one of these cables if a battery is installed at the host controller.

## Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Name	Length (L)	Order Number <sup>*1</sup>	Appearance
SGM7F-□□□F SGM7F-□□□7 Flange Specification <sup>*2</sup> : 1 or 3	Encoder cable (for incremental or multiturn absolute encoder)	0.3 m	JZSP-C7PRC0-E	
SGM7F-□□□F SGM7F-□□□7 Flange Specification <sup>*2</sup> : 1, 3, or 4	Cables with connectors on both ends (for incremental or multiturn absolute encoder)	30 m	JZSP-UCMP00-30-E	
		40 m	JZSP-UCMP00-40-E	
		50 m	JZSP-UCMP00-50-E	
SGM7F-□□□7 Flange Specification <sup>*2</sup> : 1, 3, or 4	Cable with a battery unit (for multiturn absolute encoder) <sup>*3</sup>	0.3 m	JZSP-CSP12-E	

\*1 Flexible cables are not available.

\*2 Refer to the following section for flange specifications.

 [Model Designations on page 270](#)

\*3 This cable is not required if a battery is connected to the host controller.

