

Model Designations

SGMCV - 04 B E A 1 1

Direct Drive Servomotors 1st + 2nd 3rd 4th 5th 6th 7th digit

1st + 2nd digit - Rated Output

Code	Specification
04	4 Nm
08	8 Nm
10	10 Nm
14	14 Nm
17	17 Nm
25	25 Nm
35	35 Nm

3rd digit - Servomotor Outer Diameter

Code	Specification
B	135 mm dia.
C	175 mm dia.
D	230 mm dia.

4th digit - Serial Encoder

Code	Specification
E	22-bit single-turn absolute encoder
I	22-bit multiturn absolute encoder

9th digit - Design Revision Order

Code	Specification
A	Standard Model

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
5	High machine precision (runout at end of shaft and runout of shaft surface: 0.01 mm)

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 [Nm]	Servomotor Outer Diameter		
	B (135 mm dia.)	C (175 mm dia.)	D (230 mm dia.)
4	SGMCV-04B	—	—
8	—	SGMCV-08C	—
10	SGMCV-10B	—	—
14	SGMCV-14B	—	—
16	—	—	SGMCV-16D
17	—	SGMCV-17C	—
25	—	SGMCV-25C	—
35	—	—	SGMCV-35D

Note:

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

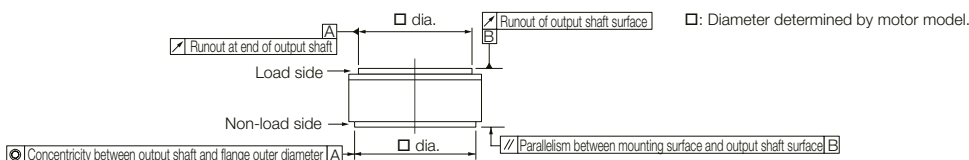
Direct Drive Servomotors SGMCV Specifications

Model SGMCV-		04B	10B	14B	08C	17C	25C	16D	35D
Time Rating		Continuous							
Thermal Class		A							
Insulation Resistance		500 VDC, 10 MΩ min.							
Withstand Voltage		1,500 VAC for 1 minute							
Excitation		Permanent magnet							
Mounting		Flange-mounted							
Drive Method		Direct drive							
Rotation Direction		Counterclockwise (CCW) for forward run 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							
Environmental Conditions	Ambient Air Temperature	0°C to 40°C (without freezing)							
	Ambient Air Humidity	20% to 80% relative humidity (without condensation)							
	Installation Site	<ul style="list-style-type: none"> · Must be indoors and free of corrosive and explosive gases. · Must be well-ventilated and free of dust and moisture. · Must facilitate inspection and cleaning. · Must have an altitude of 1,000 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 (without freezing) Storage Humidity: 20% to 80% relative humidity (without 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						
	Concentricity between Output Shaft and Flange Outer Diameter	mm	0.07						
Shock Resistance*4	Impact Acceleration Rate at Flange	490 m/s ²							
	Number of Impacts	2 times							
Vibration Resistance*4	Vibration Acceleration Rate at Flange	49 m/s ²							
Applicable SERVOPACKS	SGD7S-	2R8A, 2R8F	5R5A	2R8A, 2R8F	5R5A	7R6A	5R5A	7R6A ⁵ , 120A	
	SGD7W-	2R8A		2R8A				7R6A ⁵	

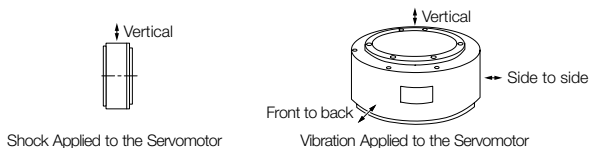
*1. A vibration class of V15 indicates a vibration amplitude of 15 μm maximum on the Servomotor without a load at the rated motor speed.

*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 rate.



*5. Use derated values for this combination. Refer to the Ratings section for information on derating values.

Direct Drive Servomotors SGMCV

Ratings

Model SGMCV-		04B	10B	14B	08C	17C	25C	16D	35D
Rated Output *1	W	126	314	440	251	534	785	503	1,100 1,000 ^{*5}
Rated Torque *1, *2	Nm	4.00	10.0	14.0	8.00	17.0	25.0	16	35
Instantaneous Maximum Torque *1	Nm	12.0	30.0	42.0	24.0	51.0	75.0	48	105
Stall Torque *1	Nm	4.00	10.0	14.0	8.00	17.0	25.0	16	35
Rated Current *1	A	1.8	2.8	4.6	2.3	4.5		5	
Instantaneous Maximum Current *1	A	5.6	8.9	14.1	7.3	14.7	13.9	16.9	16
Rated Motor Speed *1	min ⁻¹				300			300 270 ^{*5}	
Maximum Motor Speed *1	min ⁻¹	600						500	600
Torque Constant	Nm/A	2.39	3.81	3.27	3.81	4.04	6.04	3.35	7.33
Motor Moment of Inertia	$\times 10^{-4}$ kg·m ²	16.2	25.2	36.9	56.5	78.5	111	178	276
Rated Power Rate *1	kW/s	9.88	39.7	53.1	11.3	36.8	56.3	14.4	44.4
Rated Angular Acceleration Rate *1	rad/s ²	2,470	3,970	3,790	1,420	2,170	2,250	899	1,270
Heat Sink Size	mm	350 × 350 × 12			450 × 450 × 12			550 × 550 × 12	
Allowable Load Moment of Inertia (Motor Moment of Inertia Ratio)		25 times	40 times	45 times	15 times	25 times	25 times	10 times	15 times
	With External Regenerative Resistor and External Dynamic Brake Resistor ^{*3}	25 times	40 times	45 times	15 times	25 times	25 times	10 times	15 times
Allowable Load *4	Allowable Thrust Load	N			1,500			3,300	
	Allowable Moment Load	Nm			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.

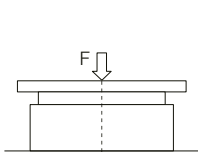
*3. To externally connect dynamic brake resistor, select hardware option specification 020 for the SERVOPACK. However, you cannot externally connect dynamic brake resistor if you use the following SERVOPACKs (maximum applicable motor capacity: 400 W).

- SGD7S-R70□□□A020 to -2R8□□□A020
- SGD7W-1R6A20A020 to -2R8A20A020
- SGD7C-1R6AMAA020 to -2R8AMAA020

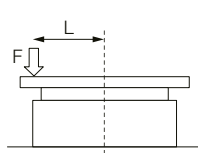
*4. The thrust loads and moment loads that are applied while a Servomotor is operating are roughly classified into the following patterns. Design the machine so that the thrust loads or moment loads will not exceed the values given in the table.

*5. If you use an SGD7S-7R6A SERVOPACK and SGMCV-35D Servomotor together, use this value (a derated value).

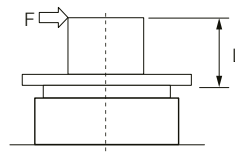
Note: For the bearings used in these Servomotors, the loss depends on the bearing temperature. The amount of heat loss is higher at low temperatures.



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



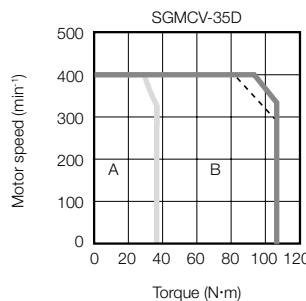
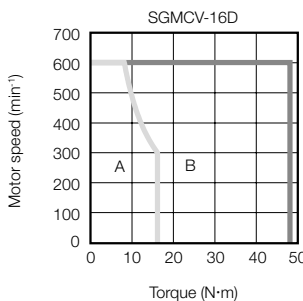
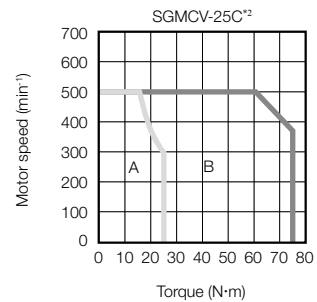
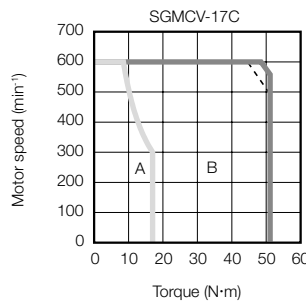
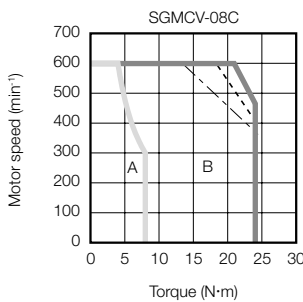
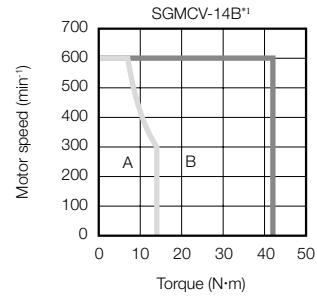
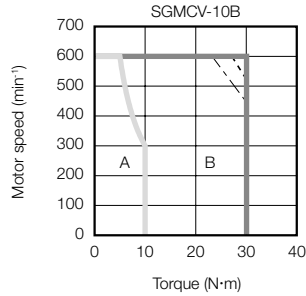
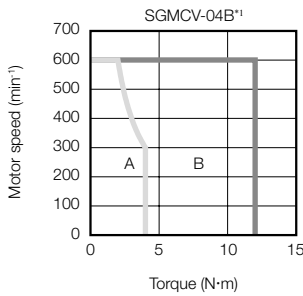
Where F is the external force,
Thrust load = F + Load mass
Moment load = F × L



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

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
 - - - - - (dashed-dotted lines): With single-phase 100-V input



*1. The characteristics are the same for three-phase 200 V, single-phase 200 V, and single-phase 100 V.

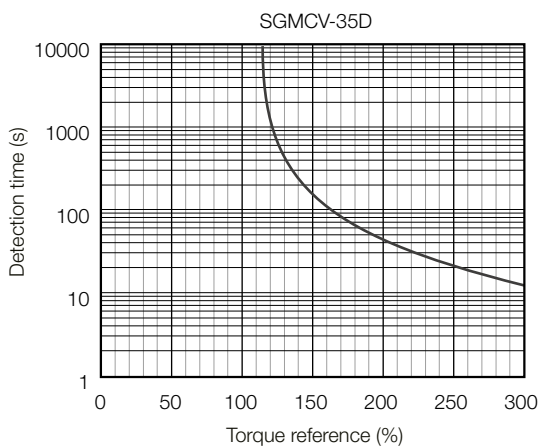
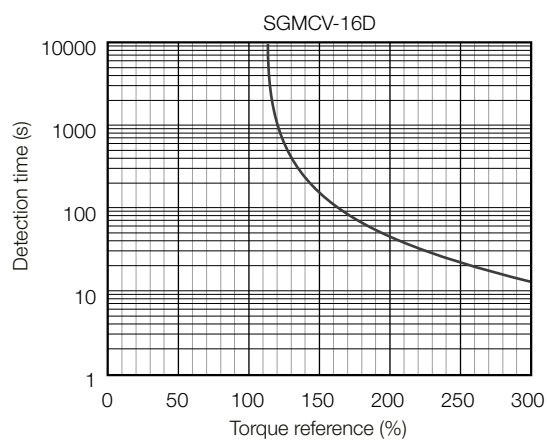
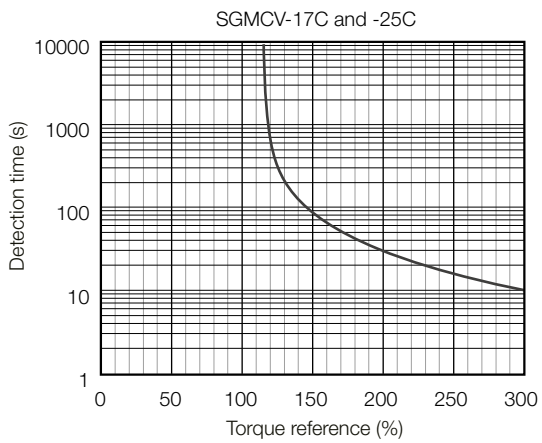
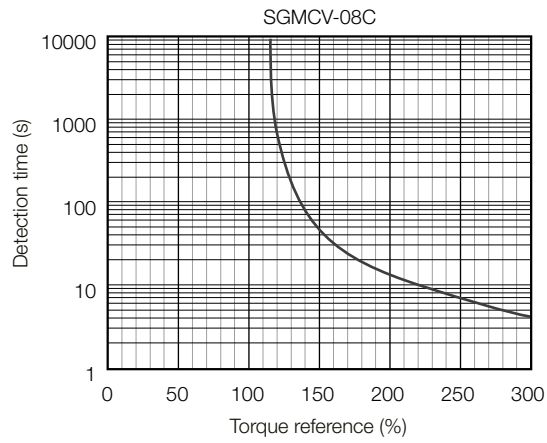
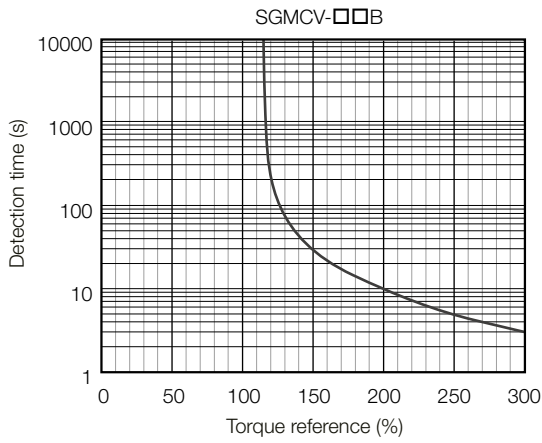
*2. Contact your YASKAWA representative for information on the SGMCV-25C.

Note:

1. These values (typical values) are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.
2. The characteristics in the intermittent duty zone depend on the power supply voltage.
3. If 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 ambient 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 torque remains within the continuous duty zone given in Torque-Motor Speed Characteristics.

Allowable Load Moment of Inertia

The allowable load moments of inertia (motor moment of inertia ratios) for the Servomotors are given in the Ratings section. The values are determined by the regenerative energy processing capacity of the SERVOPACK and are also affected by the drive conditions of the Servomotor. Perform the required Steps for each of the following cases.

Use the SigmaSize+ AC Servo Drive Capacity Selection Program to check the driving conditions. 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.

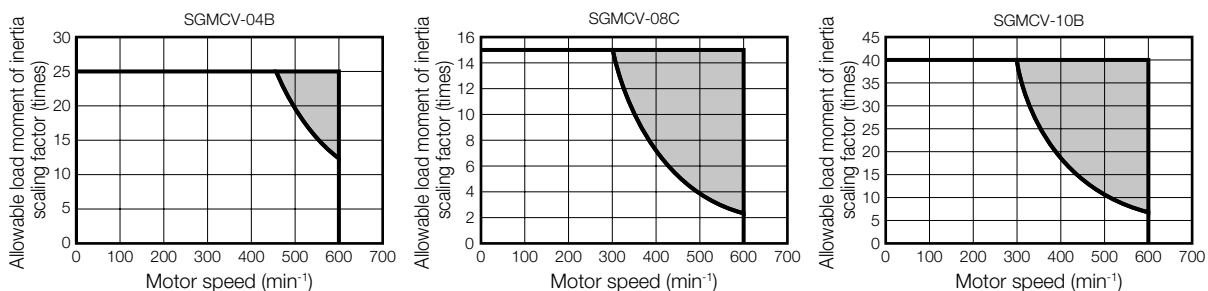
If the above steps are not possible, install an external regenerative resistor.

Information

An Overvoltage Alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a Regenerative Overload Alarm (A.320). Refer to "Built-In Regenerative Resistor" for the regenerative power (W) that can be processed by the SERVOPACKs. Install an External Regenerative Resistor when the built-in regenerative resistor cannot process all of the regenerative power.

SERVOPACKs without built-in Regenerative Resistors

The following graph shows the allowable load moment of inertia scaling factor of the motor 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 models: SGD7S-2R8A and -2R8F

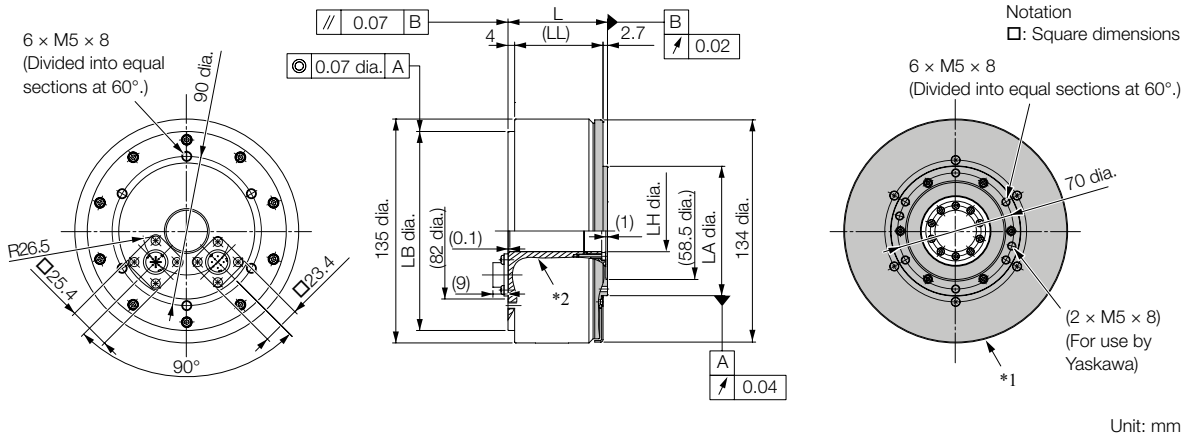
When an External Regenerative Resistor Is Required

Install the External Regenerative Resistor. Refer to the External Regenerative Resistors section for the recommended products.

External Dimensions

SGMCV-□□B

Flange Specification 1

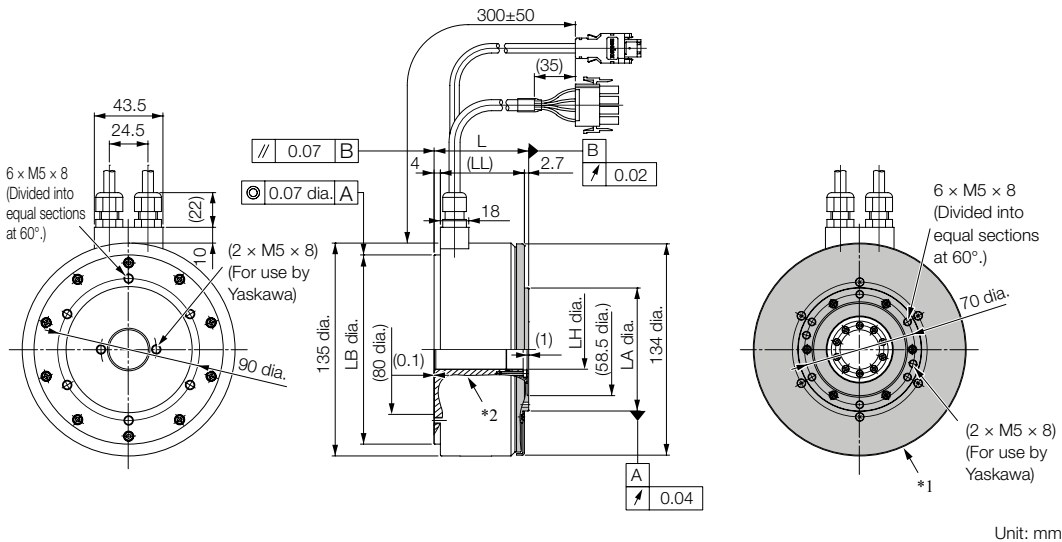


*1. The shaded section indicates the rotating parts.
*2. The hatched section indicates the non-rotating parts.

Note: Values in parentheses are reference dimensions.

Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04B□A11	60	53.3	120 ⁰ _{-0.035}	25 ^{+0.3} _{+0.1}	78 ⁰ _{-0.030}	5.0
10B□A11	85	78.3	120 ⁰ _{-0.035}	25 ^{+0.3} _{+0.1}	78 ⁰ _{-0.030}	6.5
14B□A11	115	108.3	120 ⁰ _{-0.035}	25 ^{+0.3} _{+0.1}	78 ⁰ _{-0.030}	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.

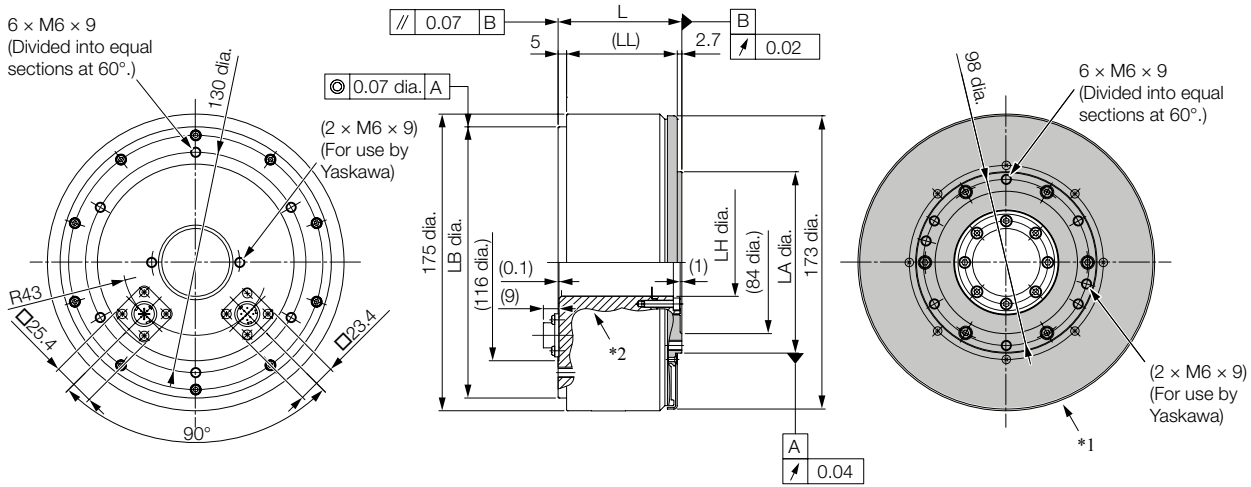
Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
04B□A41	60	53.3	120 ⁰ _{-0.035}	25 ^{+0.3} _{+0.1}	78 ⁰ _{-0.030}	5.0
10B□A41	85	78.3	120 ⁰ _{-0.035}	25 ^{+0.3} _{+0.1}	78 ⁰ _{-0.030}	6.5
14B□A41	115	108.3	120 ⁰ _{-0.035}	25 ^{+0.3} _{+0.1}	78 ⁰ _{-0.030}	9.0

Refer to the Connector Specifications section for information on connectors.

Direct Drive Servomotors SGMCV

SGMCV-□□□

Flange Specification 1



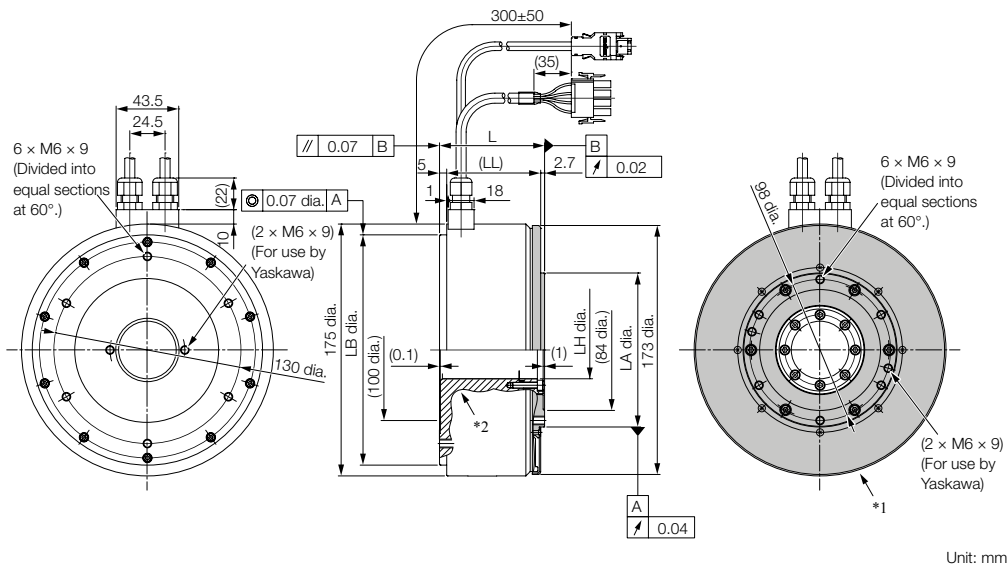
Unit: mm

*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 SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08C□A11	73	65.3	160 ⁰ _{-0.040}	40 ^{+0.3} _{+0.1}	107 ⁰ _{-0.035}	9.0
17C□A11	87	79.3	160 ⁰ _{-0.040}	40 ^{+0.3} _{+0.1}	107 ⁰ _{-0.035}	11.0
25C□A11	117	109.3	160 ⁰ _{-0.040}	40 ^{+0.3} _{+0.1}	107 ⁰ _{-0.035}	15.0

Flange Specification 4



Unit: mm

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

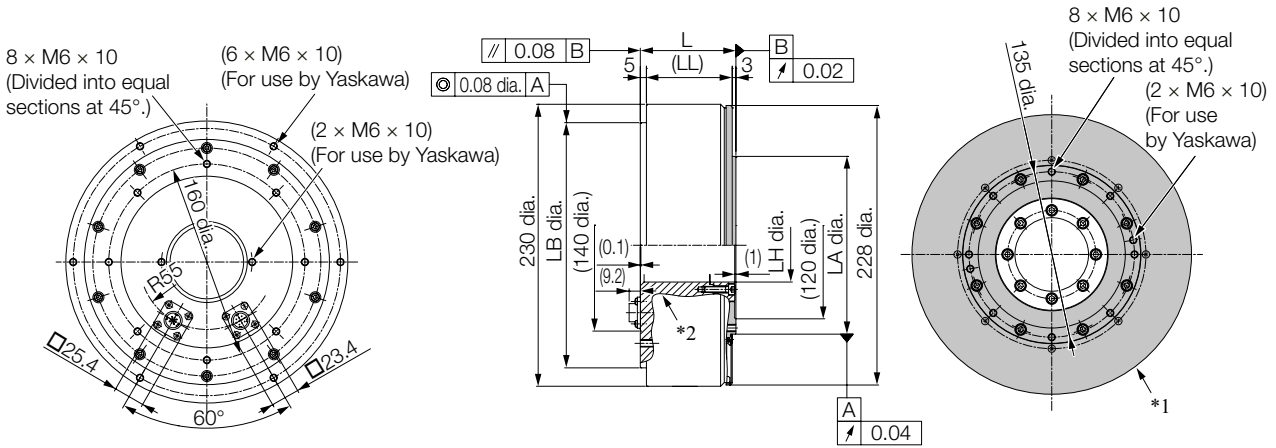
Note: Values in parentheses are reference dimensions.

Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
08C□A41	73	65.3	160 ⁰ _{-0.040}	40 ^{+0.3} _{+0.1}	107 ⁰ _{-0.035}	9.0
17C□A41	87	79.3	160 ⁰ _{-0.040}	40 ^{+0.3} _{+0.1}	107 ⁰ _{-0.035}	11.0
25C□A41	117	109.3	160 ⁰ _{-0.040}	40 ^{+0.3} _{+0.1}	107 ⁰ _{-0.035}	15.0

Refer to the Connector Specifications section for information on connectors.

SGMCV-□□□

Flange Specification 1



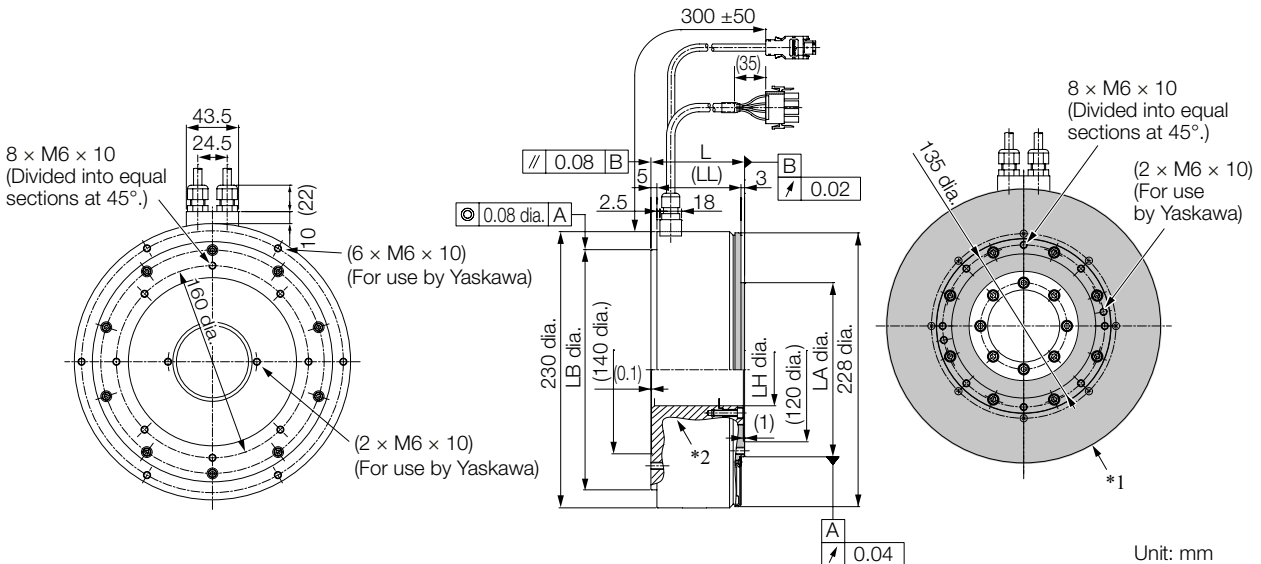
Unit: mm

*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 SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16D□A11	78	70	200 ⁰ _{-0.046}	60 ^{+0.4} ₀	145 ⁰ _{-0.04}	16
35D□A11	107	99	200 ⁰ _{-0.046}	60 ^{+0.4} ₀	145 ⁰ _{-0.04}	25

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.

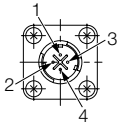
Model SGMCV-	L	(LL)	LB	LH	LA	Approx. Mass [kg]
16D□A41	78	70	200 ⁰ _{-0.046}	60 ^{+0.4} ₀	145 ⁰ _{-0.04}	16
35D□A41	107	99	200 ⁰ _{-0.046}	60 ^{+0.4} ₀	145 ⁰ _{-0.04}	25

Refer to the Connector Specifications section for information on connectors.

Connector Specifications SGMCV

Flange Specification 1

Servomotor Connector

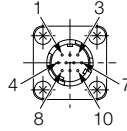


1	Phase U
2	Phase V
3	Phase W
4	FG (frame ground)

Model: JN1AS04MK2R
 Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating Connector: JN1DS04FK1
 (Not provided by YASKAWA)

Encoder Connector



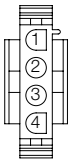
1	PS
2	/PS
3	-
4	PG5V
5*	BAT0
6	-
7	FG (frame ground)
8*	BAT
9	PG0V
10	-

* Only absolute-value models with multiturn data.
 Model: JN1AS10ML1-R
 Manufacturer: Japan Aviation Electronics Industry, Ltd.

Mating connector: JN1DS10SL1
 (Not provided by YASKAWA)

Flange Specification 4

Servomotor Connector

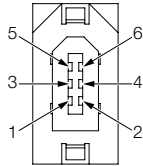


1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG (frame ground)	Green (yellow)

Models
 • 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)

* Only absolute-value models with multiturn data.
 Model: 55102-0600
 Manufacturer: Molex Japan LLC

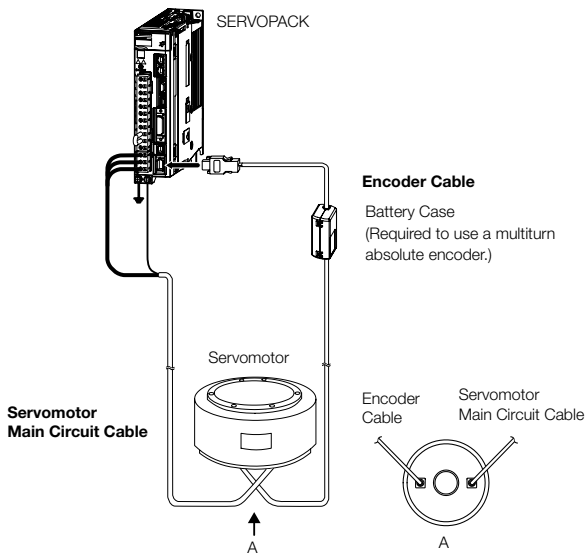
Mating Connector: 54280-0609

Selecting Cables SGMCV

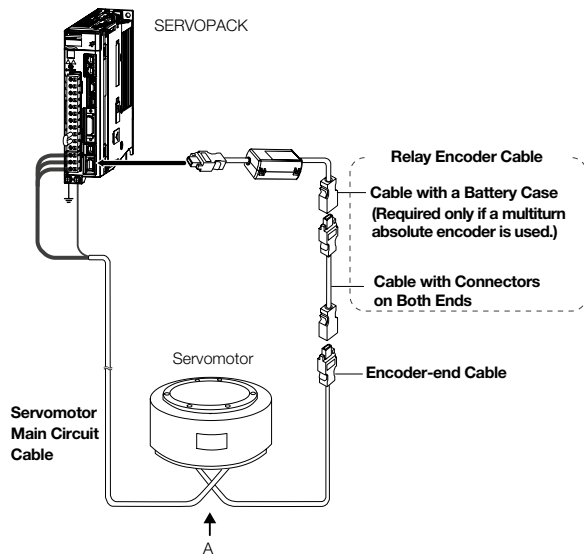
Cable Configurations

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

Encoder Cable of 20m or less



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



Note:

1. If the Encoder Cable length exceeds 20 m, be sure to 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/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-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: S1EP S800001 32)

Servomotor Main Circuit Cables

Servomotor Model	Length	Order Number		Appearance
		Standard Cable	Flexible Cable*	
SGMCV-□□□□ Flange Specification: 1 ^{*2} Non-load side installation	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	
SGMCV-□□□□ Flange Specification: 4 ^{*2} Non-load side installation (with cable on side)	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	

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

*2. Refer to the Model Designations section for the flange specifications.

Note: Direct Drive Servomotors are not available with holding brakes.

Encoder Cables of 20 m or less

Servomotor Model	Description	Length	Order Number		Appearance
			Standard Cable	Flexible Cable*1	
SGMCV-□□□E SGMCV-□□□E Flange specification: 1 *2	For singleturn absolute encoder (without Battery Case)	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	
SGMCV-□□□E SGMCV-□□□E Flange specification: 4 *2	For singleturn absolute encoder (without Battery Case)	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	
SGMCV-□□□I SGMCV-□□□I Flange specification: 1 *2	For multiturn absolute encoder (with Battery Case)	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	
SGMCV-□□□I SGMCV-□□□I Flange specification: 4 *2	For multiturn absolute encoder (with Battery Case)	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 68 mm or larger.

*2. Refer to the Model Designations section for the flange specifications.

*3. Use one of these Cables if a battery is connected to the host controller.

Relay Encoder Cables of 30 m to 50 m

Servomotor Model	Description	Length	Order Number*1	Appearance
SGMCV-□□□□ Flange specification: 1 *2	Encoder-end Cable (for single-turn/multiturn absolute encoder)	0.3m	JZSP-C7PRC0-E	
SGMCV-□□□□ Flange specification: 1 or 4 *2	Cables with Connectors on Both Ends (for single-turn/multiturn absolute encoder)	30m	JZSP-UCMP00-30-E	
		40m	JZSP-UCMP00-40-E	
		50m	JZSP-UCMP00-50-E	
SGMCV-□□□I Flange specification: 1 or 4 *2	Cable with a Battery Case (for multiturn absolute encoder)*3	0.3m	ZSP-CSP12-E	

*1. Flexible Cables are not available.

*2. Refer to the Model Designations for the flange specifications.

*3. Use one of these Cables if a battery is connected to the host controller.