Content - Rotary Servomotors



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Rotary Servomotors

SGM7J	18
SGM7A	32
SGM7G	56



Model Designations



15D

400 \

08D

04D

Specifications and Ratings

Specifications

Voltage

Model SGM7J-

Time Rating		Continuous						
Thermal Class		В						
Insulation Resist	ance	500 VDC, 1	0 MOhm min.					
Withstand Voltag	ge	1,800 VAC	for 1 minute					
Excitation		Perman	ent magnet					
Mounting		Flange	-mounted					
Drive Method		Dire	ct drive					
Rotation Directio	n	Counterclockwise (CCW) for forward r	eference when viewed fre	om the load side				
Vibration Class*1		,	/15					
	Surrounding Air Temperature	0 °C to 40 °C (With derating, usage is possible between 40 °C and 60 °C)*4						
Environmental Conditions	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 1,000 m or less. (With derating, usage is possible between 1,000 m and 2,000 m.)*⁵ 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)						
Shock Resis-	Impact Acceleration Rate at Flange	e 490 m/s ²						
tance*2	Number of Impacts	2 times						
Vibration Resis- tance*3	Vibration Acceleration Rate at Flange	49	m/s ²					
Applicable SERVOPACKs	SGD7S-	1R9D	3R5D	5R4D				

02D

*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 shock resistance for shock in the vertical direction when the Servomotor is mounted with the shaft in a horizontal position is given in the above table.



*3. The vertical, side-to-side, and front-to-back vibration resistance for vibration in three directions when the Servomotor is mounted with the shaft in a horizontal position is given in the above table. The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.



*4. If the surrounding air temperature will exceed 40°C, refer to the section "Applications where the Surrounding Air Temperature of the Servomotor Exceeds 40°C".

*5. If the altitude will exceed 1,000 m, refer to the section "Applications where the Altitude of the Servomotor Exceeds 1000m"

Appendix

Ratings

Voltage			400 V				
Model SGM7J-			02D	04D	08D	15D	
Rated Output *1		\mathbb{W}	200	400	750	1500	
Rated Torque *1,	*2	Nm	0.637	1.27	2.39	4.77	
Instantaneous Ma	aximum Torque *1	Nm	2.23	4.46	8.36	14.3	
Rated Current *1		А	1.5	1.4	2.2	4.5	
Instantaneous Ma	aximum Current *1	А	5.5	5.3	8.2	14.0	
Rated Motor Spe	ed *1	min ⁻¹		30	000		
Maximum Motor	Speed	min ⁻¹		60	000		
Torque Constant		Nm/A	0.461	0.965	1.17	1.13	
Motor Moment of	f Inertia	$ imes 10^{-4}$ kg m ²	0.263 (0.333)	0.486 (0.556)	1.59 (1.77)	4.02 (4.90)	
Rated Power Rat	e *1	kW/s	15.4 (12.1)	33.1 (29.0)	35.9 (32.2)	56.6 (46.6)	
Rated Angular Acceleration Rate *1		rad/s ²	24200 (19100)	26100 (22800)	15000 (13500)	11900 (9700)	
Heat Sink Size (A	Heat Sink Size (Aluminium) mm			$250 \times 250 \times 6$		$300 \times 300 \times 12$	
Protective Structu			Totally enclosed, self-cooled, IP67				
	Rated Voltage	V			C±10%		
	Capacity	W	6		6.5	7.5	
	Holding Torque	Nm	0.637	1.27	2.39	4.77	
Holding Brake	Coil Resistance	Ω (at 20 °C)	96±	10%	88.6±10%	76.8±10%	
Specifications *4	Rated Current	A (at 20 °C)	0.	25	0.27	0.31	
	Time Required to Release Brake	ms	6	60	80		
	Time Required to Brake	ms		10	00		
Allowable Load Moment of	Standard		15 times	10 times	12 times	6 times	
Inertia (Motor Moment of Inertia Ratio)	With External Regenera Resistor or Dynamic Br Connected		25 times		15 times	12 times	
Allowable Shaft	LF	mm	2	25	35		
Load *5	Allowable Radial Load	Ν	2	45	392	490	
2000	Allowable Thrust Load	Ν	7	74	147		

Note: The values in parentheses are for Servomotors with holding brakes.

- 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 an aluminum heat sink of the dimensions given in the table.
- 3. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.
- 4. Observe the following precautions if you use a Servomotor with a holding brake.
 - The holding brake cannot be used to stop the Servomotor.
 - The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.
 - The 24-VDC power supply is not provided by YASKAWA.
- 5. The allowable shaft loads are illustrated in the following figure. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



Motor Speed-Torque Characteristics

A : Continuous duty zone B : Intermittent duty zone



Notes:

- These values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C. These are typical values.
- The characteristics in the intermittent duty zone depend on the power supply voltage. The intermittent duty zones in the graphs show the characteristics when a three-phase, 400-VAC power supply voltage is used.
- If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.
- If you use a Servomotor Main Circuit Cable that exceeds 20 m, the intermittent duty zone in the torquemotor 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 torque remains within the continuous duty zone given in Motor Speed-Torque Characteristics above.

Load Moment of Inertia

The load moment of inertia indicates the inertia of the load. The larger the load moment of inertia, the worse the response. If the moment of inertia is too large, operation will become unstable. The allowable size of the load moment of inertia (J_L) for the Servomotor is restricted. Refer to Ratings of Rotary Serovmotors SGM7J. This value is provided strictly as a guideline and results depend on Servomotor driving conditions.

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). Perform one of the following steps if this occurs.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared using the above steps.

Servomotor Heat Dissipation Conditions

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C when a heat sink is installed on the Servomotor. If the Servomotor is mounted on a small device component, the Servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate.

Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the Servomotor Overload Protection Characteristics.

Note:

The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative.

Important:

The actual temperature rise depends on how the heat sink (i.e., the Servomotor mounting section) is attached to the installation surface, what material is used for the Servomotor mounting section, and the motor speed. Always check the Servomotor temperature with the actual equipment.



See Servomotor Ratings for more information.

Applications Where the Surrounding Air Temperature of the Servomotor Exceeds 40°C

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C. If you use a Servomotor at a surrounding air temperature that exceeds 40°C (60°C max.), apply a suitable derating rate from the following graphs. Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the Servomotor Overload Protection Characteristics.

Note:

Note:

- 1. Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.
- 2. The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative.



Applications Where the Altitude of the Servomotor Exceeds 1,000 m

The Servomotor ratings are the continuous allowable values at an altitude of 1,000 m or less. If you use a Servomotor at an altitude that exceeds 1,000 m (2,000 m max.), the heat dissipation effect of the air is reduced. Apply the appropriate derating rate from the following graphs.

Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the Servomotor Overload Protection Characteristics.

 Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.

2. The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative.



Cables & Periphery

External Dimensions

SGM7J-02 and -04



Model SGM7J-	L	LL	LM	LB	S	L1	L2	Approx. Mass [kg]
02D□F2□	108.5 (148.5)	78.5 (118.5)	51.2	500.025	14 ⁰ -0.011	25	65 (105)	0.9 (1.5)
04D D F2 D	125 (165)	95 (135)	67.2	500.025	14 -0.011	41.5	81.5 (121.5)	1.2 (1.8)

Note:

88

The values in parentheses are for Servomotors with Holding Brakes.
 Refer to the section Shaft End Specification.
 Refer to the section Connectors Specification.

SGM7J-08



Model SGM7J-	L	LL	LM	LB	S	L1	L2	Approx. Mass [kg]
08D 0 F2 0	146.5 (193.5)	106.5 (153.5)	79	700.030	19 _{-0.013}	53	93 (121.5)	2.3 (2.9)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes. 2. Refer to the section Shaft End Specification. 3. Refer to the section Connectors Specification.

SGM7J-15



Model SGM7J-	L	LL	LM	LB	S	L1	L2	Approx. Mass [kg]
15D □ F2 □	163.5 (196.5)	123.5 (156.5)	95.6	110 ⁰ -0.035	190.013	72	110 (143)	6.4 (8.1)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes. 2. Refer to the section Shaft End Specification. 3. Refer to the section Connectors Specification SGM7J-15D.

Shaft End Specifications

SGM7J-DDDDDDD

	T
Code	Specification
2	Straight without key
6	Straight with key and tap for one location (Key slot is JIS B1301-1996 fastening type.)

Shaft End Details	Servomotor Model SGM7J-				
Shart End Details	02	04	08	15	
Code: 2 (Straight without Key)					
	LR	30		40	
	S	14 ⁰ -0.011		19 ⁰ -0.013	
Code: 6 (Straight with Key and Tap)					
	LR	30)	40)
H LR H	QK	14	Ļ	22	2
	S	14 ⁰	0.011	19	0.013
	W	5		6	
	Т	5		6	
Y الج	U	3		3.	5
	Р	M5 ×	8L	M6 ×	10L

Contents

Connector Specifications

SGM7J-02 to -15

• Encoder Connector Specifications



Receptacle
Size: M12
Part number: 1419959
Model: SACC-MSQ-M12MS-25-3,2 SCO
Manufacturer: Phoenix Contact

1	PG 5V
2	PG 0V
3	FG
4	BAT (+)
5	BAT (-)
6	Data (+)
7	Data (-)
8	Empty
Housing	Shield

SGM7J-02 to -08

Servomotor Connector Specifications



Receptacle	1	(Brake)
Size: M17	3	U
	4	V
Part number: 1620448	5	Empty
Model: ST-5EP1N8AA500S	6	(Brake)
MUUEL ST-SEF INOAASUUS	7	W
Manufacturer: Phoenix Contact	FG	FG
	Housing	Shield

SGM7J-15

Servomotor Connector Specifications



Receptacle Size: M23 Part number: 1617905 Model: SF-5EP1N8AAD00S Manufacturer: Phoenix Contact

1	V
2	(Brake)
4	(Brake)
5	Ú
6	W
FG	FG
Housing	Shield

Servomotor Connector Rotational Angle

Allowable number of rotations: 10



Power Cables for rotary servomotors without holding brake

Servomotor Model	Cable & connector type	Length	Order No.	Specification
		3m	JZSP-C7M143-03-E-G6	
		5m	JZSP-C7M143-05-E-G6	
SGM7J-02 to -08	Flexible Power cable 4 x 1.5 mm ² with M17 connector	10m	JZSP-C7M143-10-E-G6	
		15m	JZSP-C7M143-15-E-G6	
		20 m	JZSP-C7M143-20-E-G6	
		3m	JZSP-C7M144-03-E-G6	
		5m	JZSP-C7M144-05-E-G6	
SGM7J-15	Flexible Power cable 4 x 1.5 mm ² with M23 connector	10m	JZSP-C7M144-10-E-G6	
		15m	JZSP-C7M144-15-E-G6	(10 587%) (SF-553 W0480A (S) Serve Rate start
		20 m	JZSP-C7M144-20-E-G6	

Pin Layout for Power Cables for rotary servomotors without holding brake

JZSP-C7M143-xx-E-G6



Pin No.	Function	Wire Color
1	n.c.	n.c.
2	n.c.	n.c.
3	U	Black wire 1
4	V	Black wire 2
6	n.c.	n.c.
7	W	Black wire 3
PE (5)	PE	Green-yellow
Housing		Shield

JZSP-C7M144-xx-E-G6



Connector: SF-5ES1N8A80A1S (1618194) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	n.c.	n.c.
4	n.c.	n.c.
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

Contents

Power Cables for rotary servomotors with holding brake

Servomotor Model	Cable & connector type	Length	Order No.	Specification
		3m	JZSP-C7M343-03-E-G6	
	Flexible Power cable 4 x	5m	JZSP-C7M343-05-E-G6	
SGM7J-02 to -08	1.5mm ² & 2 x 1.5mm ² for brake with M17 connector	10m	JZSP-C7M343-10-E-G6	
		15m	JZSP-C7M343-15-E-G6	(\$2,4550) (ST-653788A80055) Serve Rover sient Serve Ras siest
		20 m	JZSP-C7M343-20-E-G6	
		3m	JZSP-C7M344-03-E-G6	
	Flexible Power cable 4 x 1.5mm ² & 2 x 1.5mm ² for brake with M23 connector	5m	JZSP-C7M344-05-E-G6	
SGM7J-15		10m	JZSP-C7M344-10-E-G6	
		15m	JZSP-C7M344-15-E-G6	156 187960 (SF-525 WeABADASS) Constant Serve Piets start
		20 m	JZSP-C7M344-20-E-G6	

Pin Layout for Power Cables for rotary servomotors with holding brake

JZSP-C7M343-xx-E-G6



Connector: ST-6ES1N8A8005S (1624550) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	+	Black
2	n.c.	n.c.
3	U	Black wire 1
4	V	Black wire 2
6	-	White
7	W	Black wire 3
PE (5)	PE	Green-yellow
Housing		Shield

JZSP-C7M344-xx-E-G6



Connector: SF-5ES1N8A80A3S (1618196) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	+	Black
4	-	White
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

Encoder cables for rotary servomotors

Sigma-7 cable

Cable & connector type	Lengui	for absolute encoder*	encoder	Арреагансе
	3m	JZSP-C7PA2M-03-E-G□	JZSP-C7PI2M-03-E-G6	
Elexible Encoder cable	5m	JZSP-C7PA2M-05-E-G□	JZSP-C7PI2M-05-E-G6	
with straight connector M12	10 m	JZSP-C7PA2M-10-E-G□	JZSP-C7PI2M-10-E-G6	
IVIIZ	15 m	JZSP-C7PA2M-15-E-G□	JZSP-C7PI2M-15-E-G6	
	20 m	JZSP-C7PA2M-20-E-G□	JZSP-C7PI2M-20-E-G6	
	Зm	JZSP-C7PA2N-03-E-G□	JZSP-C7PI2N-03-E-G6	
Elexible Encoder cable	5m	JZSP-C7PA2N-05-E-G□	JZSP-C7PI2N-05-E-G6	38
with angled connector M12	10 m	JZSP-C7PA2N-10-E-G	JZSP-C7PI2N-10-E-G6	
IVIIZ	15 m	JZSP-C7PA2N-15-E-G	JZSP-C7PI2N-15-E-G6	
	20 m	JZSP-C7PA2N-20-E-G	JZSP-C7PI2N-20-E-G6	
Sigma-7 Extension for Encoder cable with Con- nectors length 0.3m for Abs. Encoder	0.3m	JZSP-CSP12-E-G5	-	SERVOPACK End 0.3 m Encoder End

Sigma-7 cable

* Sigma-7 cables for absolute encoders have a battery case (Battery attached). Currently under preparation.

Motor Connection Shielding Clamp

Shielding clamp mountable on Sigma-7 400 V SERVOPACKs up to 15 kW. Contact your YASKAWA representative for more information.

SERVOPACK Model	Order No.	Specification
Sigma-7 400V up to 3.0kW	KLBUE 4-13.5_SC	
Sigma-7 400V from 5kW up to 7.5kW	KLBUE 10-20_SC	B
Sigma-7 400 V for 11 kW & 15 kW	KLBUE 15-32_SC	

Contents

SGM7A

Model Designations



warehouse products.

Specifications and Ratings

Specifications

Voltage							400 V					
Model SGM7A		10D	15D	20D	25D	30D	40D	50D	70D			
Time Rating		Continuous										
Thermal Class		BF										
Insulation Resist	tance					500	VDC, 10 M	Ω min.				
Withstand Volta	ge					1,800	VAC for 1	minute				
Excitation						Per	manent ma	ignet				
Mounting						FI	ange-mour	ted				
Drive Method							Direct driv	Э				
Rotation Direction	on			Counterclo	ockwise (CC	CW) for forw	ard referen	ce when vie	ewed from	the load sic	le	
Vibration Class*	1						V15					
	Surrounding Air Temperature	0 °C to 40 °C (With derating, usage is possible between 40 °C and 60 °C)*4										
	Surrounding Air Humidity		20% to 80% relative humidity (with no condensation)									
Environmental Conditions	Installation Site	Must bMust fMust h	 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 m or less. (With derating, usage is possible between 1,000 m and 2,000 m.)*⁵ Must be free of strong magnetic fields. 									
	Storage Environment		Store the		Storage Te	wing enviro emperature 20 % to 80	-20 °C to	60 °C (with	no freezing		sconnecte	d.
Shock	Impact Accelerati- on Rate at Flange			0	,		490 m/s²			,		
Resistance*2	Number of Impacts	ts 2 times										
Vibration Resistance*3	Vibration Accelera- tion Rate at Flange	49 m/s ² (Models 15A to 30D: 24.5 m/s ² front to back) 14.							14.7 m/s ²			
	SGD7S-	1F	R9D	3R5D	5F	84D	8R4D	12	0D	17	0D	260D
Applicable SERVOPACKs	SGD7W-	2R6D*6	2R6D*6 or 5R4D*6	2R6D or 5R4D* ⁶	5R4D*6	5R4D				-		

*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 shock resistance for shock in the vertical direction when the Servomotor is mounted with the shaft in a horizontal position is given in the above table.



Shock Applied to the Servomotor

*3 The vertical, side-to-side, and front-to-back vibration resistance for vibration in three directions when the Servomotor is mounted with the shaft in a horizontal position is given in the above table. The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.



*4 Refer to the section "Applications where the Surrounding Air Temperature of the Servomotor Exceeds 40°C".

*5 If the altitude will exceed 1,000 m, refer to the section "Applications where the Altitude of the Servomotor Exceeds 1000m".

*6 If you use this combination, performance may not be as good, e.g., the control gain may not increase, in comparison with using a Sigma-7 Single Axis SERVOPACK.

Servomotor Ratings

Voltage			400 V										
Model SGM7A-			02D	04D	08D	10D	15D	20D	25D	30D	40D	50D	70D
Rated Output*1		W	200	400	750	1,000	1,500	2,000	2,500	3,000	4,000	5,000	7,000
Rated Torque*1,*	2	Nm	0.637	1.27	2.39	3.18	4.90	6.36	7.96	9.80	12.6	15.8	22.3
Instantaneous Ma Torque*1	aximum	Nm	2.23	4.46	8.36	11.1	14.7	19.1	23.9	29.4	37.8	47.6	54.0
Rated Current*1		A	1.2	1.2	2.2	3.2	4.7	6.1	7.4	8.9	12.5	13.8	19.2
Instantaneous Ma Current*1	aximum	А	5.1	4.9	8.5	12	14	20	25	28	38	42	52.5
Rated Motor Spe	ed*1	min ⁻¹						3000					
Maximum Motor	Speed ^{*1}	min ⁻¹						6000*6					
Torque Constant		Nm/A	0.556	1.11	1.16	1.07	1.23	1.18	1.15	1.16	1.06	1.21	1.21
Motor Moment o	f Inertia	×10 ⁻⁴ kg m ²	0.139 (0.209)	0.216 (0.286)	0.775 (0.955)	0.971 (1.15)	2.00 (2.25)	2.47 (2.72)	3.19 (3.44)	7.00 (9.20)	9.60 (11.8)	12.3 (14.5)	12.3
Rated Power Rat		kW/s	29.2 (19.4)	74.7 (56.3)	73.7 (59.8)	104 (87.9)	120 (106)	164 (148)	199 (184)	137 (104)	165 (134)	203 (172)	404
Rated Angular Ad Rate*1		rad/s ²	45,800 (30,400)	58,700 (44,400)	30,800 (25,000)	32,700 (27,600)	24,500 (21,700)	25,700 (23,300)	24,900 (23,100)	14,000 (10,600)	13,100 (10,600)	12,800 (10,800)	18,100
Derating Rate for with Dust Seal	Servomotor	%		-		95				100			
Heat Sink Size		mm	28	$50 \times 250 \times$	6		300 × 3	800 × 12			400 × 4	400 × 20	
Protective Struct				Totally enclosed, self-cooled, IP67							Totally enclosed, separately cooled (with fan), IP22 cooled (with fan)		
	Rated Voltage	V	24 VDC ± 10 %									-	
	Capacity	W	6	6	6	6.5 12			10			-	
	Holding Torque	Nm	0.637	1.27	2.39	3.18	7.84	7.84	10		20		-
Holding Brake	Coil Resistance	Ω (at 20 °C)	96±	10%	88.6	±10% 48±10%				59		-	
Specifications*4	Rated Current	A (at 20 °C)	0.	25	0.	27		0.5			0.41		-
	Time required to release Brake	ms	6	0	8	0		170			100		-
	Time required to brake	ms		1(00				8	0			-
Allowable Load	Standard		30 times		20 times			10 times			5 times		15 times
Moment of Inertia (Motor Moment of Inertia Ratio) With External Regenerative Resistor and Dynamic Bra- ke Resistor Connected		30 times	30 times 20 times 30 tim		mes 20 times		15 times						
	LF	mm	2	5	Э	5		45		63			
Allowable Shaft Load*5	Allowable Radial Load	Ν	24	15	3	92	686			980 1,176			
	Allowable Thrust Load	Ν	7	4	1	47	196		392				

Note: The values in parentheses are for Servomotors with Holding Brakes.

*1. For the SGM7A-02D to SGM7A-10D, 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. For the SGM7A-15D to SG-M7A-30D, 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 an alu-minum heat sink of the dimensions given in the table.

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

*4. Observe the following precautions if you use a Servomotor with a Holding Brake.

• The holding brake cannot be used to stop the Servomotor.

- The 24-VDC power supply is not provided by YASKAWA.
- *5. The allowable shaft loads are illustrated in the following figure. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.

*6. For the SGM7A-25D, the maximum motor speed for the continuous duty zone is 5,000 min-1. Use the Servomotor within the continuous duty zone for the average motor speed and effective torque



[•] The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.

Motor Speed-Torque Characteristics

Torque (N·m)

50

40

30

20

10

0



SGM7A-02D

В

А

1000 2000 3000 4000 5000 6000

Motor speed (min⁻¹)

2.5

2

1.5

1

0.5

0

Torque (N·m)

0 1000 2000 3000 4000 5000 6000 Motor speed (min⁻¹)





SGM7A-04D



SGM7A-50D

В

A

Motor speed (min-1)

1000 2000 3000 4000 5000 6000

20 Torque (N·m) 15 10 5 0

A 0 1000 2000 3000 4000 5000 6000

В

SGM7A-08D

В

A

1000 2000 3000 4000 5000 6000

Motor speed (min⁻¹)

SGM7A-25D

10

8

6

4

2

0

25

Torque (N·m)

Motor speed (min⁻¹)







Motor speed (min-1)

Note:

1. For the SGM7A-02D to SGM7A-10D, these values are for operation in combination with a SERVOPACK when the temperature of the armature winding is 100°C.

For the SGM7A-15D to SGM7A-30D, 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. The intermittent duty zones in the graphs show the characteristics when a three-phase, 400-VAC power supply voltage is used.
- 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.





Contents

Rotary Motors

Linear Motors

SERVOPACKs

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 torque remains within the continuous duty zone given in Motor Speed-Torque Characteristics.

Load Moment of Inertia

The load moment of inertia indicates the inertia of the load. The larger the load moment of inertia, the worse the response. If the moment of inertia is too large, operation will become unstable.

The allowable size of the load moment of inertia (J_L) for the Servomotor is restricted. Refer to Ratings of Rotary Servomotors SGM7J. This value is provided strictly as a guideline and results depend on Servomotor driving conditions.

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). Perform one of the following steps if this occurs.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared using the above steps.

Servomotor Heat Dissipation Conditions

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C when a heat sink is installed on the Servomotor. If the Servomotor is mounted on a small device component, the Servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate. Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the section Servomotor Overload Protection Characteristics.

Note:

The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative.

Important:

The actual temperature rise depends on how the heat sink (i.e., the Servomotor mounting section) is attached to the installation surface, what material is used for the Servomotor mounting section, and the motor speed. Always check the Servomotor temperature with the actual equipment.







See Servomotor Ratings for more information

Applications Where the Surrounding Air Temperature of the Servomotor Exceeds 40°C

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C. If you use a Servomotor at a surrounding air temperature that exceeds 40°C (60°C max.), apply a suitable derating rate from the following graphs.

Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the section Servomotor Overload Protection Characteristics.

Note: 1. Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor. 2. The derating rates are applicable only when the average motor speed is less than or equal to the rated motor

speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative









Applications Where the Altitude of the Servomotor Exceeds 1,000 m

The Servomotor ratings are the continuous allowable values at an altitude of 1,000 m or less. If you use a Servomotor at an altitude that exceeds 1,000 m (2,000 m max.), the heat dissipation effect of the air is reduced. Apply the appropriate derating rate from the following graphs. Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the section Servomotor Overload Protection Characteristics.

Note:

 Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.

The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative.









External Dimensions

SGM7A-02, -04



Model SGM7A-	L	LL	LM	LB	S	L1	L2	Approx. Mass [kg]
02D □ F2 □	108.5 (148.5)	78.5 (118.5)	51.2	50 _{-0.025}	14 ⁰ -0.011	25	65 (105)	0.9 (1.5)
04D D F2 D	125 (165)	95 (135)	67.2	50 ⁰ -0.025	14 ⁰ -0.011	41.5	81.5 (121.5)	1.2 (1.8)

Note:

The values in parentheses are for Servomotors with Holding Brakes. Refer to the section Shaft End Specifications for SGMA7A-02 to -10. Refer to the section Connector Specifications.

SGM7A-08



Model SGM7A-	L	LL	LM	LB	S	L1	L2	Approx. Mass [kg]
08D□F2□	146.5 (193.5)	106.5 (153.5)	79	70 ⁰ -0.030	19 ⁰ -0.013	53	93 (140)	2.4 (3.0)

Note: The values in parentheses are for Servomotors with Holding Brakes. Refer to the section Shaft End Specifications for SGMA7A-02 to -10. Refer to the section Connector Specifications.

SGM7A-10



Model SGM7A-	L	LL	LM	LB	S	L1	L2	Approx. Mass [kg]
10D □ F2 □	171 (218)	131 (178)	103.5	70 _{-0.030}	19 ⁰ -0.013	77	117.5 (164.5)	3.2 (3.8)

Note:

The values in parentheses are for Servomotors with Holding Brakes. Refer to the section Shaft End Specifications for SGMA7A-02 to -10. Refer to the section Connector Specifications.

Options

• With Dust Seal

Model SGM7A-	Dimensions with Dust Seal						
Model SGW/A-	E1	E2	LS1	LS2			
10D	47	61	5.5	11			



Unit: mm

Shaft End Specifications for SGM7A-02 to -10

SGM7A-DDDDDDD



Shaft End Details	Servomotor Model SGM7A-					
Shart End Details	02	04	08	10		
Code: 2 (Straight without Key)						
	LR	30		40		
	S	14 ⁰ _{-0.011}		19 ⁰ _{-0.013}		
Code: 6 (Straight with Key and Tap)						
	LR	30		40		
	QK	14		22		
	S		0 -0.011		0 -0.013	
	W	5	5	6	j	
	Т	5		6		
	U	Э	}	3.5		
	Ρ	M5 >	< 8L	M6 ×	10L	



SGM7A-15, -20, and -25



Model SGM7A-	L	LL	LM	L1	L2	LB	Shaft Dimen		Approx.
							S	Q	Mass [kg]
15D 🗆 F2 🗖	204 (245)	159 (200)	121 (162)	90	145 (187)	95 ⁰ -0.035	24 ⁰ -0.013	40	4.7 (6.1)
20D 🗆 F2 🗖	220 (261)	175 (216)	137 (178)	106	161 (203)	95 ⁰ -0.035	24 ⁰ -0.013	40	5.5 (6.9)
25D 🗆 F2 🗖	243 (294)	198 (249)	160 (211)	129	184 (235)	95 _{-0.035}	24 ⁰ -0.013	40	6.9 (8.8)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes. 2. Servomotors with Dust Seals have the same dimensions. 3. Refer to Shaft End Specifications for SGM7A-15 to -70 for details. Refer to the section Connector Specifications.

SGM7A-30 to -50



L	LL	LM	L1	L2	LB			Approx.
						S	Q	Mass [kg]
259 (295)	196 (232)	158 (194)	131	183 (219)	110 ⁰ -0.035	28 _{-0.013}	55	10.6 (13.1)
298 (334)	235 (271)	197 (233)	170	222 (258)	110 ⁰ -0.035	28 _{-0.013}	55	14.0 (16.5)
338 (374)	275 (311)	237 (273)	210	262 (298)	110 ⁰ -0.035	28 _{-0.013}	55	17.0 (19.5)
	(295) 298 (334) 338	259 196 (295) (232) 298 235 (334) (271) 338 275	259 196 158 (295) (232) (194) 298 235 197 (334) (271) (233) 338 275 237	259 196 158 131 (295) (232) (194) 131 298 235 197 170 (334) (271) (233) 338 275 237 210	259 196 158 131 183 (295) (232) (194) 131 (219) 298 235 197 170 222 (334) (271) (233) 170 262 338 275 237 210 262	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	$ \begin{array}{ c c c c c c c c c } \hline L & LL & LM & L1 & L2 & LB & \hline Dimension \\ \hline 259 & 196 & 158 & 131 & 183 & 110^{0}_{-0.035} & 28^{0}_{-0.013} \\ \hline (295) & (232) & (194) & 170 & 222 & 110^{0}_{-0.035} & 28^{0}_{-0.013} \\ \hline (334) & (271) & (233) & 170 & 222 & 110^{0}_{-0.035} & 28^{0}_{-0.013} \\ \hline 338 & 275 & 237 & 210 & 262 & 110^{0} & 28^{0} \\ \hline \end{array} $	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$

Note: 1. The values in parentheses are for Servomotors with Holding Brakes. 2. Servomotors with Dust Seals have the same dimensions. 3. Refer to Shaft End Specifications for SGM7A-15 to -70 for details. Refer to the section Connector Specifications.

SGM7A-70



Model SGM7A-	L	LL	LM	L1	L2	LB	Shaft Dimen		Approx.
							S	Q	Mass [kg]
70D 🗖 F2 🗖	397	334	291	204	262	110 ⁰ -0.035	28 _{-0.013}	55	19.0

Note: 1. The values in parentheses are for Servomotors with Holding Brakes. 2. Servomotors with Dust Seals have the same dimensions. 3. Refer to Shaft End Specifications for SGM7A-15 to -70 for details. Refer to the section Connector Specifications.

Cooling Fan Specification

- Single-Phase, 220V
- 50/60 Hz
- 17/15W
- 0.11/0.09 A

Shaft End Specifications for SGM7A-15 to -70

SGM7A-000000

Code	Specification
2	Straight without key
6	Straight with key and tap for one location (Key slot is JIS B1301-1996 fastening type.)

Shaft End Details		Servomotor Model SGM7A-						
		15 20	25	30	40	50	70	
Code: 2 (Straight without Key)								
	LR	45			63			
	Q	40			55			
S dia.	S	24 ⁰ -0.013		28	8 ⁰ -0.013			
Code: 6 (Straight with Key and Tap)								
	LR	45			63			
	Q	40			55			
	QK	32			50			
	S	24 ⁰ -0.013		28	0 8-0.013			
	W			8				
U P	Т			7				
	U			4				
	Ρ		M8 so	crew, Depth: 16				

Connector Specifications

SGM7A-02 to -70

• Encoder Connector Specifications

3	$\frac{2}{2}$ $\frac{8}{2}$
4	
	<u>ک</u> لا
<u>ل</u> ھ	
5_/	\ <u>6</u>

Descrite	1	PG 5V
Receptacle	2	PG 0V
Size: M12	3	FG
	4	BAT (+)
Part number: 1419959	5	BAT (-)
Madel CACC MCO MIGNE DE D.D.CCO	6	Data (+)
Model: SACC-MSQ-M12MS-25-3,2 SCO	7	Data (-)
Manufacturer: Phoenix Contact	8	Empty
	Housing	Shield

SGM7A-02 to -08

• Servomotor Connector Specifications

Receptacle

Part number: 1620448

Model: ST-5EP1N8AA500S

Manufacturer: Phoenix Contact

Size: M17



SGM7A-10 to -50

Servomotor Connector Specifications



Receptacle Size: M23 Part number: 1617905 Model: SF-5EP1N8AAD00S Manufacturer: Phoenix Contact

1	V
2	(Brake)
4	(Brake)
5	Ŭ
6	W
FG	FG
Housing	Shield

(Brake) U

Empty

(Brake)

v

Ŵ FG Shield

1

3

4 5

6

7 FG

Housing

SGM7A-70

• Servomotor Connector Specifications



Receptacle Size: M40 Part number: 1607927 Model: SM-5EPWN8AAD00S Manufacturer: Phoenix Contact

U	U
V	V
W	W
+	Empty
-	Empty
FG	FG
Housing	Shield

SGM7A-70

• Fan Connector Specifications



Receptacle Size: M17 Part number: 1620448 Model: ST-5EP1N8AA500S Manufacturer: Phoenix Contact

1	ALARM TERMINAL
3	FAN MOTOR
4	FAN MOTOR
6	ALARM TERMINAL
7	Empty
FG	FG
Housing	Shield

Servomotor Connector Rotational Angle

Allowable number of rotations: 10

SGM7A-02 to -10

SGM7A-70



SGM7A-15 to -25



SGM7A-30 to -50



Power Cables for rotary servomotors without holding brake

Servomotor Model	Cable & connector type	Length	Order No.	Specification
	3m	JZSP-C7M143-03-E-G6		
		5m	JZSP-C7M143-05-E-G6	
SGM7A-02 to -08	Flexible Power cable 4 x 1.5 mm ² with M17 connector	10m	JZSP-C7M143-10-E-G6	
		15m	JZSP-C7M143-15-E-G6	
		20 m	JZSP-C7M143-20-E-G6	
		Зm	JZSP-C7M144-03-E-G6	
		5m	JZSP-C7M144-05-E-G6	
SGM7A-10 to -25	Flexible Power cable 4 x 1.5 mm ² with M23 connector	10m	JZSP-C7M144-10-E-G6	
		15m	JZSP-C7M144-15-E-G6	(1618761) (57-9531864804.5) (57-9531864804.5) (57-9531864804.5)
		20 m	JZSP-C7M144-20-E-G6	
		Зm	JZSP-C7M154-03-E-G6	
		5m	JZSP-C7M154-05-E-G6	
SGM7A-30	Flexible Power cable 4 x 2.5 mm ² with M23 connector	10m	JZSP-C7M154-10-E-G6	
		15m	JZSP-C7M154-15-E-G6	19975) 197-55388480425) Like J
		20 m	JZSP-C7M154-20-E-G6	
		Зm	JZSP-C7M164-03-E-G6	
	Flexible Power cable 4 x 4 mm ² with M23 connector	5m	JZSP-C7M164-05-E-G6	
SGM7A-40 to -50		10m	JZSP-C7M164-10-E-G6	
		15m	JZSP-C7M164-15-E-G6	
		20 m	JZSP-C7M164-20-E-G6	
SGM7A-70	Flexible Power cable 4 x 6.0 mm ² with M40 connector	3m	JZSP-C7M175-03-E-G6	
		5m	JZSP-C7M175-05-E-G6	
		10 m	JZSP-C7M175-10-E-G6	
		15m	JZSP-C7M175-15-E-G6	eng,] eng,] (1051,279) (1051,279) - Serre Rear Like 1 Serre Rear Like 2
		20 m	JZSP-C7M175-20-E-G6	

Pin Layout for Power Cables for rotary servomotors without holding brake JZSP-C7M143-xx-E-G6



Connector: ST-6ES1N8A8004S (1613580) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	n.c.	n.c.
2	n.c.	n.c.
3	U	Black wire 1
4	V	Black wire 2
6	n.c.	n.c.
7	W	Black wire 3
PE (5)	PE	Green-yellow
Housing		Shield

JZSP-C7M144-xx-E-G6



Connector: SF-5ES1N8A80A1S (1618194) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	n.c.	n.c.
4	n.c.	n.c.
5	U	Black wire 1
6	VV	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M154-xx-E-G6



Connector: SF-5ES1N8A80A2S (1618195) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	n.c.	n.c.
4	n.c.	n.c.
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M164-xx-E-G6



Connector: SF-5ES1N8A80A3S (1618199) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	n.c.	n.c.
4	n.c.	n.c.
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M175-xx-E-G6



Connector: SM-5ES1N8A8L32S (1613428) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
V	V	Black wire 2
+	n.c.	n.c.
-	n.c.	n.c.
U	U	Black wire 1
W	VV	Black wire 3
PE	PE	Green-yellow
Housing		Shield

JZSP-C7M185-xx-E-G6



Connector: SM-5ES1N8A8L33S (1613429) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
\vee	V	Black wire 2
+	n.c.	n.c.
-	n.c.	n.c.
U	U	Black wire 1
W	W	Black wire 3
PE	PE	Green-yellow
Housing		Shield
Power Cables for rotary servomotors with holding brake

Servomotor Model	Cable & connector type	Length	Order No.	Specification
	Flexible Power cable 4 x	Зm	JZSP-C7M343-03-E-G6	
		5m	JZSP-C7M343-05-E-G6	
SGM7A-02 to -08	1.5 mm ² & 2 x 1.5 mm ² for	10m	JZSP-C7M343-10-E-G6	
	brake with M17 connector	15m	JZSP-C7M343-15-E-G6	(52/350) (ST-653/96480055) <u>Letter letter</u> Serve Rove start Serve Rove start
		20 m	JZSP-C7M343-20-E-G6	
		3m	JZSP-C7M344-03-E-G6	
	Flexible Power cable 4 x	5m	JZSP-C7M344-05-E-G6	
SGM7A-10 to -25	$1.5mm^2\&2x1.5mm^2$ for	10m	JZSP-C7M344-10-E-G6	
	brake with M23 connector	15m	JZSP-C7M344-15-E-G6	(56-555 States) Contraction (56-555 States) (5
		20 m	JZSP-C7M344-20-E-G6	
	Flexible Power cable 4 x 2.5 mm ² & 2 x 1.5 mm ² for brake with M23 connector	3m	JZSP-C7M354-03-E-G6	
		5m	JZSP-C7M354-05-E-G6	
SGM7A-30		10m	JZSP-C7M354-10-E-G6	
		15m	JZSP-C7M354-15-E-G6	156/362500460A350
		20 m	JZSP-C7M354-20-E-G6	
		3m	JZSP-C7M364-03-E-G6	<u></u>
	Flexible Power cable 4 x	5m	JZSP-C7M364-05-E-G6	
SGM7A-40 to -50	4 mm ² & 2 x 1.5 mm ² for	10m	JZSP-C7M364-10-E-G6	
	brake with M23 connector	15m	JZSP-C7M364-15-E-G6	(56/8797) (57-55780488253) Serie Refer 148 1 Serie Refe 148 2
		20 m	JZSP-C7M364-20-E-G6	
		3m	JZSP-C7M375-03-E-G6	
	Flexible Power cable 4 x	5m	JZSP-C7M375-05-E-G6	
SGM7A-70	6.0 mm ² & 2 x 1.5 mm ² for	10m	JZSP-C7M375-10-E-G6	
	brake with M40 connector	15m	JZSP-C7M375-15-E-G6	Construenteror Canada La Seria Real Canada La Seria
		20 m	JZSP-C7M375-20-E-G6	

Pin Layout for Power Cables for rotary servomotors with holding brake

JZSP-C7M343-xx-E-G6



Connector: ST-6ES1N8A8005S (1624550) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	+	Black
2	n.c.	n.c.
3	U	Black wire 1
4	V	Black wire 2
6	-	White
7	W	Black wire 3
PE (5)	PE	Green-yellow
Housing		Shield

JZSP-C7M344-xx-E-G6



Connector: SF-5ES1N8A80A3S (1618196) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	+	Black
4	-	White
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M354-xx-E-G6



Connector: SF-5ES1N8A80A3S (1618195) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	+	Black
4	-	White
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M364-xx-E-G6



Connector: SF-5ES1N8A8LB2S (1618199) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	+	Black
4	-	White
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M375-xx-E-G6



Connector: SM-5ES1N8A8L32S (1613428) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
\vee	V	Black wire 2
+	+	Black wire 1.50
-	-	Black wire 1.50
U	U	Black wire 1
W	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

Encoder cables for rotary servomotors

Cable & connector type	Length	Sigma-7 cable for absolute encoder*	Sigma-7 cable for incremental encoder	Appearance
	3m	JZSP-C7PA2M-03-E-G	JZSP-C7PI2M-03-E-G6	
Flexible Encoder cable	5m	JZSP-C7PA2M-05-E-G	JZSP-C7PI2M-05-E-G6	
with straight connector M12	10 m	JZSP-C7PA2M-10-E-G	JZSP-C7PI2M-10-E-G6	
IVI 12	15 m	JZSP-C7PA2M-15-E-G	JZSP-C7PI2M-15-E-G6	
	20 m	JZSP-C7PA2M-20-E-G	JZSP-C7PI2M-20-E-G6	
	3m	JZSP-C7PA2N-03-E-G	JZSP-C7PI2N-03-E-G6	
Elexible Encoder cable	5m	JZSP-C7PA2N-05-E-G	JZSP-C7PI2N-05-E-G6	
with angled connector M12	10 m	JZSP-C7PA2N-10-E-G	JZSP-C7PI2N-10-E-G6	
IVI 12	15 m	JZSP-C7PA2N-15-E-G	JZSP-C7PI2N-15-E-G6	han an a
	20 m	JZSP-C7PA2N-20-E-G	JZSP-C7PI2N-20-E-G6	
Sigma-7 Extension for Encoder cable with Con- nectors length 0.3m for Abs. Encoder	0.3 m	JZSP-CSP12-E-G5	-	SERVOPACK End 0.3 m Encoder End Battery Case (Battery attached)

* Sigma-7 cables for absolute encoders have a battery case (Battery attached). Currently under preparation.

Fan cables for rotary servomotors

Description	Cable & connector type	Length	Sigma-7 Flexible Cable		Appearance		
		3m	JZSP-C7M343-03-E-G6				
	Flexible Power cable for FAN 4 x 1.5 mm ² &	5m	JZSP-C7M343-05-E-G6				
Fan cable for SGM7A-70	2 x 1.5 mm ² with M17 connector	10 m	JZSP-C7M343-10-E-G6		To a company		
	(Standard Power cable used for FAN)	15 m	JZSP-C7M343-15-E-G6				
		20 m JZSP-C7M343-15-E-G6					
			Pin No.	Function	Wire Color		
				1	Alarm terminal	Black	
	Connector: ST-6F	- S1N8A80)05S (1624544)	2	n.c.	n.c.	
Ma®bn			JZSP-C7M343-05-E-G6 JZSP-C7M343-10-E-G6 JZSP-C7M343-15-E-G6 JZSP-C7M343-20-E-G6 Pin No. Function Wire Colo 1 Alarm terminal Black 2 n.c. n.c.		Black (U)		

Contact: ST-10KP030 (1618261) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	Alarm terminal	Black
2	n.c.	n.c.
3	Fan motor	Black (U)
4	Fan motor	Black (V)
6	Alarm terminal	White
7	n.c.	Black (W)
PE	PE	Green-yellow
Housing	-	Shield

Motor Connection Shielding Clamp

Shielding clamp mountable on Sigma-7 400 V SERVOPACKs up to 15 kW. Contact your YASKAWA representative for more information.

SERVOPACK Model	Order No.	Specification
Sigma-7 400V up to 3.0kW	KLBUE 4-13.5_SC	
Sigma-7 400V from 5kW up to 7.5kW	KLBUE 10-20_SC	B
Sigma-7 400V for 11 kW & 15 kW	KLBUE 15-32_SC	

SGM7G

Sigma-7 Series Servomotors: SGM7G

-	05	D	F		F	6	F		
	1st + 2nd	3rd	4th	Į	ōth	6th	7th	digit	
1st + 2	nd digit - Ra	ted Outpu	ıt			ver Supply		6th di	git - Shaft End
Code	Specificatio	on		Voltag				Code	Specification
05	450 W			Code	Specif	ication		2	Straight without key
09	850 W			D	400 VA	C		2	(450 W, 1.8 kW, 2.9 kW)
13	1.3 kW							6	Straight with key and tap (450 W, 1.8 kW, 2.9 kW)
20	1.8 kW			4th dig	jit - Seri	al Encoder		S*1	Straight without key
30	2.9 kW			Code	Specif	ication		5.	(850 W, 1.3 kW)
				7	24-bit a	absolute		K *1	Straight with key and tap (850 W, 1.3 kW)
44	4.4 kW			F	24-bit	incrementa			(050 44, 1.5 K44)
55	5.5 kW								
75	7.5 kW			5th dia	iit - Des	ign Revisio	n		
1A	11.0 kW			Order	,			7th di	git - Options
1E	15.0 kW			Code	Specif	ication		Code	Specification
				F	Standa	ard Model		1	Without options
				R*2	High-s	beed Model		С	With holding brake (24 VDC)

*1 The shaft end codes are different for 850 kW and 1.3 kW Servomotors. The shaft diameter for 850 W Servomotors is 19 mm. The shaft diameter for 1.3 kW Servomotors is 22 mm.
*2 Available up to 4.4 kW.

F With dust seal With dust seal and holding

Н brake (24 VDC)

Bolded options are considered standard warehouse products.

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Rotary Motors

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Cables & Periphery

Appendix

Specifications and Ratings

Specifications

Voltage					40	D V						
Model SGM7G	i-		05D	09D	13D	20D	30D	44D	55D	75D	1AD	1ED
Time Rating		Continuous										
Thermal Class			F									
Insulation Resist	tance						500 VDC, -	I0 MΩ min.				
Withstand Volta	ge						1,800 VAC	for 1 minute)			
Excitation							Permaner	nt magnet				
Mounting							Flange-r	nounted				
Drive Method								drive				
Rotation Direction	on					Countercloc whe		V) for forwa om the load		9		
Vibration Class*							V					
	Surrounding Air Temperature				(With de	erating, usa	0 °C to ge is possib		40 °C and	60 °C)*4		
	Surrounding	Air Humidity	20% to 80% relative humidity (with non-condensing)									
Environmental Conditions	Installation S	ite	 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 m or less. (With derating, usage is possible between 1,000 m and 2,000 m.)*5 Must be free of strong magnetic fields. 									
	Storage Envi	ronment	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 (non-condensing)									
Shock Resistance*2	Impact Acce at Flange	leration Rate					490	m/s²				
	Number of In	1					2 tir	nes				
Vibration Resistance*3	Vibration Acc Rate at Flanc			49 n	n/s² (24.5 m	/s² front to k	back)			24.5	5 m/s²	
	When using	SGD7S-	1R9D	3R5D	5R4D	8R4D	120D	170D	210D	260D	280D	370D
Applicable	a Standard Servomotor	SGD7W-	2R6D*6 or 5R4D*6	5R4D*6	5R4D				-			
SERVOPACKs	When	SGD7S-	3R5D	5R4D	8R4D	120D	170D	210D			-	
	using a High-speed Servomotor	SGD7W-	2R6D or 5R4D*6	5R4D				-	-			

*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 shock resistance for shock in the vertical direction when the Servomotor is mounted with the shaft in a horizontal position is given in the above table.



*3. The vertical, side-to-side, and front-to-back vibration resistance for vibration in three directions when the Servomotor is mounted with the shaft in a horizontal position is given in the above table. The strength of the vibration that the Servomotor can withstand depends on the application. Always check the vibration acceleration rate that is applied to the Servomotor with the actual equipment.



*4. If the surrounding air temperature will exceed 40°C, refer to the section "Applications where the Surrounding Air Temperature of the Servomotor Exceeds 40°C".

*5. If the altitude will exceed 1,000 m, refer to the section "Applications where the Altitude of the Servomotor Exceeds 1000m".

*6. If you use this combination, performance may not be as good, e.g., the control gain may not increase, in comparison with using a Sigma-7S SERVOPACK.

Servomotor Ratings

Standard Servomotors

Voltage							400 V						
Model SGM7G-			05D	09D	13D	20D	30D	44D	55D	75D	1AD	1ED	
Rated Output *1		kW	0.45	0.85	1.3	1.8	2.9	4.4	5.5	7.5	11	15	
Rated Torque *1, 7	2	Nm	2.86	5.39	8.34	11.5	18.6	28.4	35.0	48.0	70.0	95.4	
Instantaneous Ma	aximum Torque *1	Nm	8.92	13.8	23.3	28.7	45.1	71.6	87.6	119	175	224	
Rated Current *1		A	1.9	3.5	5.4	8.4	11.9	16	20.8	25.7	28.1	37.2	
Instantaneous Ma	aximum Current *1	A	5.5	8.5	14	20	28	40.5	52	65	70	85	
Rated Motor Spe	ed *1	min ⁻¹		1,500									
Maximum Motor	Speed *1	min ⁻¹				3,000					2,	000	
Torque Constant		Nm/A	1.71	1.72	1.78	1.50	1.70	1.93	1.80	1.92	2.76	2.86	
Motor Moment of	Inertia	×10 ⁻⁴ kg m ²	3.33 (3.58)	13.9 (16.0)	19.9 (22.0)	26.0 (28.1)	46.0 (53.9)	67.5 (75.4)	89 (96.9)	125 (133)	242 (261) 202 (188) 2,890	303 (341)	
Rated Power Rate	e *1	kW/s	24.6 (22.8) 8,590	20.9 (18.2) 3,880	35.0 (31.6) 4,190	50.9 (47.1) 4,420	75.2 (64.2) 4,040	119 (107) 4,210	138 (126) 3,930	184 (173) 3840		300 (267)	
Rated Angular Ac	celeration Rate *1	rad/s ²	(7,990) 250 × 250	(3,370)	(3,790)	(4,090)	(3,450)	(3,770)	(3,610)	(3,610)	(2,680)	3,150 (2,800)	
Heat Sink Size	Heat Sink Size mm		× 6 (aluminium)	400 :	× 400 × 20 (steel)		550 × 550	× 30 (steel)			650 × 35 :eel)	
Protective Structu	ire *3					,	closed, self		67				
	Rated Voltage	\vee	24 VDC 0 / +10%										
	Capacity	W		10				3.5		25	32	35	
	Holding Torque	Nm	4.5	12.7	19	9.6	43	43.1 72.6		84.3	114.6		
Holding Brake	Coil Resistance	Ω (at 20 °C)	56		59		3	31	2	23	18	17	
Specifications *4	Rated Current	A (at 20 °C)	0.43		0.41		0.	.77	1.	05	1.33	1.46	
	Time Required to Release Brake	ms		10	0				170			250	
	Time Required to Brake	ms		80)		1	00		8	30		
Allowable Load	Standard		15 times			5 times				10 1	times		
Moment of Inertia With External Regenerative (Motor Moment Resistor and Dynamic Brake of Inertia Ratio) Resistor Connected		15 times 10 times											
,	LF	mm	40		58		7	79		113		16	
Allowable Shaft Load *5	Allowable Radial Load	Ν	490	C	686	980	1,470			1,764		4,998	
	Allowable Thrust Load	Ν	98	5	343	392	4	90		588		2,156	

Note:

The values in parentheses are for Servomotors with Holding Brakes.

- *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 an aluminum or steel heat sink of the dimensions given in the table.
- *3. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.
- *4. Observe the following precautions if you use a Servomotor with a Holding Brake.
- The holding brake cannot be used to stop the Servomotor.
- The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.
- The 24-VDC power supply is not provided by YASKAWA.
- *5. The allowable shaft loads are illustrated in the following figure. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



High-speed Servomotors

Voltage			400 V								
Model SGM7G-			05D	09D	13D	20D	30D	44D			
Rated Output *1		kW	0.45	0.85	1.3	1.8	2.9	4.4			
Rated Torque *1, *2 Nm		Nm	2.86	5.39	8.34	11.5	18.6	28.4			
Instantaneous M	aximum Torque *1	Nm	8.8	15	22	28.7	50.0	71.1			
Rated Current *1		A	2.6	5.3	8.3	10.1	14.4	19.3			
Instantaneous M	aximum Current *1	А	8.2	14	21	24	40	50			
Rated Motor Spe	eed *1	min ⁻¹			1,5	500					
Maximum Motor	Speed *1	min ⁻¹		5,0	000		4,5	00			
Allowable Contin	uous Motor Speed	min ⁻¹	5,000		4,000		3,300	3,000			
Torque Constant		Nm/A	1.13	1.12	1.09	1.27	1.36	1.58			
Motor Moment o	f Inertia	$\times 10^{-4}$ kg m ²	3.33 (3.58)	13.9 (16)	19.9 (22)	26 (28.1)	46.0 (53.9)	67.5 (75.4)			
Rated Power Rate *1		kW/s	24.6 (22.8) 8,590	20.9 (18.2) 3,880	35 (31.6) 4,190	50.9 (47.1) 4,420	75.2 (64.2) 4,040	119 (107) 4,210			
Rated Angular Acceleration Rate *1 rad/s ²			(7,990) 250 × 250 ×	(3,370)	(3,790)	(4,090)	(3,450)	(3,770)			
Heat Sink Size		mm	6 (aluminium)		40	$0 \times 400 \times 20$ (ste	eel)				
Protective Struct			Totally enclosed, self-cooled, IP67								
	Rated Voltage	V	24 VDC 0 / +10%								
	Capacity	W			10		18.5				
	Holding Torque	Nm	4.5	12.7		9.6	43				
Holding Brake	Coil Resistance	Ω (at 20 °C)	56		59		3				
Specifications *4	Rated Current	A (at 20 °C)	0.43		0.41		0.7	77			
	Time Required to Release Brake	ms		1	00		17	70			
	Time Required to Brake	ms		8	30		10	00			
Allowable Load Moment of	Standard		8 times	2 times	4 times	3 times	2 times				
(Motor Moment of Inertia Ratio)	With External Regenerative Resistor and Dynamic Brake Resis- tor Connected		15 times	4 times	7 times	6 times	6 times	5 times			
Allowable Ok-ft	LF	mm	40		58		7	9			
Allowable Shaft Loads *5	Allowable Radial Load	Ν	49	0	686	980	1,4	70			
20000	Allowable Thrust Load	Ν	98	3	343	392	49	90			

Note:

The values in parentheses are for Servomotors with Holding Brakes.

- *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 an aluminum or steel heat sink of the dimensions given in the table.
- *3. This does not apply to the shaft opening. Protective structure specifications apply only when the special cable is used.
- *4. Observe the following precautions if you use a Servomotor with a Holding Brake.
- The holding brake cannot be used to stop the Servomotor.
- The time required to release the brake and the time required to brake depend on which discharge circuit is used. Confirm that the operation delay time is appropriate for the actual equipment.
- The 24-VDC power supply is not provided by YASKAWA.
- *5. The allowable shaft loads are illustrated in the following figure. Design the mechanical system so that the thrust and radial loads applied to the Servomotor shaft end during operation do not exceed the values given in the table.



Appendix

Motor Speed-Torque Characteristics

Standard Servomotors

A : Continuous duty zoneB : Intermittent duty zone



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. The intermittent duty zone in the graphs show the characteristics when a three-phase, 400-VAC power supply voltage is used.
- 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.

High-speed Servomotors

A : Continuous duty zone









when a three-phase, 400-VAC power supply voltage is used.

because the voltage drop increases

Note: 1.

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4.



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

If the effective torque is within the allowable range for the rated torque, the Servomotor can be used within the intermittent duty zone.

The characteristics in the intermittent duty zone depend on the power supply voltage. The intermittent duty zone in the graphs show the characteristics

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





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Servomotor Overload Protection Characteristics

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

Standard Servomotors



Note:

The 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 Motor Speed-Torque Characteristics.

SGM7G-20

SGM7G-09

300

250

SGM7G-05 SGM7G-09, -13, and -20 10000 10000 1000 1000 Detection time (s) Detection time (s) 100 100 SGM7G-05 10 10 SGM7G-13 1 1 0 50 100 150 200 250 300 350 0 50 100 150 200 Torque reference (percent of rated torque) (%) Torque reference (percent of rated torque) (%) SGM7G-30 and -44 10000 1000 Detection time (s) 100 SGM7G-30 10 SGM7G-44 1 0 50 100 150 200 250 300

High-speed Servomotors

Note: The 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 Motor Speed-Torque Characteristics

Torque reference (percent of rated torque) (%)

Load Moment of Inertia

The load moment of inertia indicates the inertia of the load. The larger the load moment of inertia, the worse the response. If the moment of inertia is too large, operation will become unstable.

The allowable size of the load moment of inertia (JL) for the Servomotor is restricted. Refer to Ratings of Rotary Serovmotors SGM7J. This value is provided strictly as a guideline and results depend on Servomotor driving conditions.

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). Perform one of the following steps if this occurs.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared using the above steps.

Servomotor Heat Dissipation Conditions

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C when a heat sink is installed on the Servomotor. If the Servomotor is mounted on a small device component, the Servomotor temperature may rise considerably because the surface for heat dissipation becomes smaller. Refer to the following graphs for the relation between the heat sink size and derating rate. Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the section Servomotor Overload Protection Characteristics.

Note:

The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative.

Important:

The actual temperature rise depends on how the heat sink (i.e., the Servomotor mounting section) is attached to the installation surface, what material is used for the Servomotor mounting section, and the motor speed. Always check the Servomotor temperature with the actual equipment.



See Servomotor Ratings for more information.

Applications Where the Surrounding Air Temperature of the Servomotor Exceeds 40°C

The Servomotor ratings are the continuous allowable values at a surrounding air temperature of 40°C. If you use a Servomotor at a surrounding air temperature that exceeds 40°C (60°C max.), apply a suitable derating rate from the following graphs.

Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the section Servomotor Overload Protection Characteristics.

Note:

1. Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.

The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative.







Applications Where the Altitude of the Servomotor Exceeds 1,000 m

The Servomotor ratings are the continuous allowable values at an altitude of 1,000 m or less. If you use a Servomotor at an altitude that exceeds 1,000 m (2,000 m max.), the heat dissipation effect of the air is reduced. Apply the appropriate derating rate from the following graphs. Also, change the overload warning and overload alarm detection timing in advance based on the overload detection level of the motor. Refer to the section Servomotor Overload Protection Characteristics.

Note:

1. Use the combination of the SERVOPACK and Servomotor so that the derating conditions are satisfied for both the SERVOPACK and Servomotor.

The derating rates are applicable only when the average motor speed is less than or equal to the rated motor speed. If the average motor speed exceeds the rated motor speed, consult with your YASKAWA representative







External Dimensions

SGM7G-05



Model SGM7A-	L	LL	LM	L1	L2	LB	Shaft Dimen		Approx.
							S	Q	Mass [kg]
05D 🗆 F2 🗖	181 (214)	141 (174)	103 (136)	74	127 (161)	80 ⁰ -0.030	16 ⁰ -0.011	30	3.3 (4.3)

Note:

The values in parentheses are for Servomotors with Holding Brakes.
 Refer to the section Shaft End Specifications.
 Refer to the section Connector Specifications.

SGM7G-09, -13, -20

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Refer to Shaft End Specifications.

and a construction

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79 dia.

Unit: mm

Model	L	LL	LM	L1	L2	LB	Shaft End Dimensions		Approx Mass [kg]	
SGM7G-							S	Q	rippiexi indee [itg]	
09DEFSE	197 (233)	139 (175)	101 (137)	69	125 (161)	110 ⁰ -0.035	19 ⁰ -0.013	40	5.6 (7.6)	
13DEFSE	213 (249)	155 (191)	117 (153)	85	141 (177)	110 ⁰ -0.035	22 ⁰ -0.013	40	7.2 (9.1)	
20D □ F2 □	231 (267)	173 (209)	135 (171)	103	159 (195)	110 ⁰ -0.035	24 ⁰ -0.013	40	8.7 (11.1)	

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Note: 1. The values in parentheses are for Servomotors with Holding Brakes. 2. Servomotors with Dust Seals have the same dimensions. 3. Refer to the section Shaft End Specifications. Refer to the section Connector Specifications SGM7G.

SGM7G-30, -44, -55 and -75









Unit: mm

Model	L	LL	LM	L1	L2	LB	Shaft Enc sio		Approx. Mass [kg]
SGM7G-							S	Q	
30D0F20	241 (289)	162 (210)	124 (172)	94	149 (197)	114.3 _{-0.035}	35 ₀ ^{+0.01}	76	13.6 (19.6)
44D D F2 D	265 (313)	186 (234)	148 (196)	118	173 (221)	114.3 ⁰ -0.025	35 ₀ +0.01	76	18.0 (24.0)
44D D R2 D	265 (313)	186 (234)	148 (196)	112		114.3 ⁰ -0.025		76	18.0 (24.0)
55D D F2 D	336 (380)	223 (267)	185 (229)	143		114.3 ⁰ -0.025		110	22.0 (28.0)
75D D F2 D	382 (426)	269 (313)	231 (275)	189	256 (300)	114.3 ⁰ -0.025	42 _{-0.016}	110	30.0 (35.5)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes. 2. Servomotors with Dust Seals have the same dimensions. 3. Refer to the section Shaft End Specifications. Refer to the section Connector Specifications.

SGM7G-1A and -1E



Unit: mm

Model	I	LL	LM	L1	L2	LB	KL1	Shaft Er	d Dimer	nsions	Approx. Mass [kg]
SGM7G-								S	S1	Q	ripproxi made [rig]
1ADDF2D	449 (500)	333 (384)	295 (346)	227	319 (371)	200 ⁰ -0.046	188	42 _{-0.016}	50	110	57.5 (65.5)
1EDOF2O	511 (600)	395 (484)	357 (446)	289	382 (470)	200 ⁰ -0.046	188	55 ^{+0.030} _{+0.011}	60	110	67.5 (79.5)

Note: 1. The values in parentheses are for Servomotors with Holding Brakes. 2. Servomotors with Dust Seals have the same dimensions. 3. Refer to the section Shaft End Specifications. Refer to the section Connector Specifications.

Shaft End Specifications

SGM7G-DDDDDDD

Code	Specification
2 or S*	Straight without key
6 or K*	Straight with key and tap for one location (Key slot is JIS B1301-1996 fastening type.)

Τ

		Servomotor Model SGM7G-									
Shaft End Details		05	09	13	20	30 44	55 75	1A	1E		
Code: 2 or S* (Straight without Key)											
	LR	40	58	58	58	79	113	1	16		
	Q	30	40	40	40	76		110			
		16 _ _{-0.011}	19 _{-0.013}	22 0 -0.01 ³	240 	35 ₀ ^{+0.01}	42 ⁰ -0.016	42 ⁰ -0.016	55 ^{+0.030} +0.011		
Code: 6 or K* (Straight with Key and Tap)										
	LR	40	58	58	58	79	113	1.	16		
	Q	30	40	40	40	76		110			
	QK	20	25	25	25	60		90			
	S	16 _ _{-0.011}	0 19 _{-0.013}	22 _{-0.013}	0 24 _{-0.013}	35 ₀ +0.01	42 _{-0.016}	42 ⁰ -0.016	55 +0.030 +0.011		
	W	5	5	6	8	10		12	16		
	Т	5	5	6	7		8		10		
	U	3	3	3.5	4		5		6		
	Ρ		M5 screw,	Depth: 12		M12 screw, Depth: 25	M16 x	32L	M20 x 40L		

* The code for the shaft end depends on the model: SGM7G-05, -20, -30, -44, -55, -75, -1A, or -1E: 2 or 6 SGM7G-09 or -13: S or K

Connector Specifications

SGM7G-05DDF to -44DDF and SGM7G-05DDR to -30DDR

• Encoder Connector Specifications



	1	PG 5V
Receptacle	2	PG 0V
Size: M12	3	FG
	4	BAT (+)
Part number: 1419959	5	BAT (-)
Madal CACC MCO MIONO DE D.D.CO	6	Data (+)
Model: SACC-MSQ-M12MS-25-3,2 SCO	7	Data (-)
Manufacturer: Phoenix Contact	8	Empty
	Housing	Shield

• Servomotor Connector Specifications



Receptacle	1	V
Size: M23	2	(Brake)
Part number: 1617905	4	(Brake)
Model: SF-5EP1N8AAD00S	6	Ŵ
	FG Housing	FG Shield
Manufacturer: Phoenix Contact	5	

SGM7G-55D T to -1ED F and SGM7G-44D R

• Encoder Connector Specifications



De conte ele	1	PG 5V
Receptacle	2	PG 0V
Size: M12	3	FG
B	4	BAT (+)
Part number: 1419959	5	BAT (-)
Madal CACC MCO MIONO DE D.D.CO	6	Data (+)
Model: SACC-MSQ-M12MS-25-3,2 SCO	7	Data (-)
Manufacturer: Phoenix Contact	8	Empty
	Housing	Shield

• Servomotor Connector Specifications



Receptacle Size: M40 Part number: 1607927 Model: SM-5EPWN8AAD00S Manufacturer: Phoenix Contact

1	FGJV
2	PG 0V
3	FG
4	BAT (+)
5	BAT (-)
6	Data (+)
7	Data (-)
8	Empty
Housing	Shield

U	U
V	V
W	W
+	(Brake)
7	(Brake)
FG	FG
Housing	Shield

Servomotor Connector Rotational Angle

Allowable number of rotations: 10

SGM7G-05D to -20D

SGM7G-30D□□, -44D□F





SGM7G-44D R, -55D F, -75D F, -1AD A and -1AD F



Contents

Rotary Motors

Linear Motors

SERVOPACKs

Option Modules

Cables & Periphery

Appendix

Power Cables for rotary servomotors without holding brake

Servomotor Model	Cable & connector type	Length	Order No.	Specification
		3m	JZSP-C7M144-03-E-G6	
SGM7G-05 to -20		5m	JZSP-C7M144-05-E-G6	
SGM7G-05 to -09	Flexible Power cable 4 x 1.5 mm ² with M23 connector	10 m	JZSP-C7M144-10-E-G6	
High Speed		15m	JZSP-C7M144-15-E-G6	(15/1974) (SF-S(SIN6A80A(S))
		20 m	JZSP-C7M144-20-E-G6	
		3m	JZSP-C7M154-03-E-G6	
SGM7G-30		5m	JZSP-C7M154-05-E-G6	
SGM7G-13 to -20	Flexible Power cable 4 x 2.5 mm ² with M23 connector	10 m	JZSP-C7M154-10-E-G6	
High Speed		15m	JZSP-C7M154-15-E-G6	IN 9975 Last Last Last
		20 m	JZSP-C7M154-20-E-G6	
		3m	JZSP-C7M164-03-E-G6	s
SGM7G-44		5m	JZSP-C7M164-05-E-G6	
SGM7G-30	Flexible Power cable 4 x 4 mm ² with M23 connector	10 m	JZSP-C7M164-10-E-G6	
High Speed		15 m	JZSP-C7M164-15-E-G6	
		20 m	JZSP-C7M164-20-E-G6	
		3m	JZSP-C7M175-03-E-G6	
SGM7G-55 to -75		5m	JZSP-C7M175-05-E-G6	
SGM7G-44	Flexible Power cable 4 x 6.0 mm ² with M40 connector	10 m	JZSP-C7M175-10-E-G6	
High Speed		15m	JZSP-C7M175-15-E-G6	eng.u-J image: mage:
		20 m	JZSP-C7M175-20-E-G6	
		3m	JZSP-C7M185-03-E-G6	
	Flexible Power cable 4 x 10.0 mm ² with M40 con- nector	5m	JZSP-C7M185-05-E-G6	
SGM7G-1A to -1E		10 m	JZSP-C7M185-10-E-G6	
		15 m	JZSP-C7M185-15-E-G6	
		20 m	JZSP-C7M185-20-E-G6	

Pin Layout for Power Cables for rotary servomotors without holding brake

JZSP-C7M144-xx-E-G6



Connector: SF-5ES1N8A80A1S (1618194) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	n.c.	n.c.
4	n.c.	n.c.
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M154-xx-E-G6



Connector: SF-5ES1N8A80A2S (1618195) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	\vee	Black wire 2
2	n.c.	n.c.
4	n.c.	n.c.
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M164-xx-E-G6



Connector: SF-5ES1N8A80A3S (1618199) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	n.c.	n.c.
4	n.c.	n.c.
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M175-xx-E-G6



Connector: SM-5ES1N8A8L32S (1613428) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
V	V	Black wire 2
+	n.c.	n.c.
-	n.c.	n.c.
U	U	Black wire 1
W	W	Black wire 3
PE	PE	Green-yellow
Housing		Shield

JZSP-C7M185-xx-E-G6



Connector: SM-5ES1N8A8L33S (1613429) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
V	V	Black wire 2
+	n.c.	n.c.
-	n.c.	n.c.
U	U	Black wire 1
W	W	Black wire 3
PE	PE	Green-yellow
Housing		Shield

Power Cables for rotary servomotors with holding brake

	Servomotor Model	Cable & connector type	Length	Order No.	Specification
			3m	JZSP-C7M344-03-E-G6	
	SGM7G-05 to -20	Flexible Power cable 4 x	5m	JZSP-C7M344-05-E-G6	
	SGM7G-05 to -09	$1.5mm^2\&2x1.5mm^2$ for	10 m	JZSP-C7M344-10-E-G6	
	High Speed	brake with M23 connector	15 m	JZSP-C7M344-15-E-G6	(19(5776)) (SF-SS 59(6480A SS) Serve Reiz viet Serve Serve Reiz viet Serve Reiz viet Se
			20 m	JZSP-C7M344-20-E-G6	
			3m	JZSP-C7M354-03-E-G6	
	SGM7G-30	Flexible Power cable 4 x	5m	JZSP-C7M354-05-E-G6	
	SGM7G-13 to -20	2.5 mm ² & 2 x 1.5 mm ² for	10 m	JZSP-C7M354-10-E-G6	
	High Speed	brake with M23 connector	15 m	JZSP-C7M354-15-E-G6	156-525 M6460A355 541 5646 5662
			20 m	JZSP-C7M354-20-E-G6	
			3m	JZSP-C7M364-03-E-G6	
	SGM7G-44	Flexible Power cable 4 x	5m	JZSP-C7M364-05-E-G6	
	SGM7G-30	4 mm ² & 2 x 1.5 mm ² for	10 m	JZSP-C7M364-10-E-G6	
	High Speed	brake with M23 connector	15m	JZSP-C7M364-15-E-G6	(56/9727) (SF-SISTR6A8(825)) Serie Roter side 1 Serie Rote side 2
			20 m	JZSP-C7M364-20-E-G6	
			3m	JZSP-C7M375-03-E-G6	
	SGM7G-55 to -75	Flexible Power cable 4 x	5m	JZSP-C7M375-05-E-G6	
	SGM7G-44	$6.0mm^2\&2x1.5mm^2$ for	10 m	JZSP-C7M375-10-E-G6	
	High Speed	brake with M40 connector	15m	JZSP-C7M375-15-E-G6	Generation Construction Constru
			20 m	JZSP-C7M375-20-E-G6	
			3m	JZSP-C7M385-03-E-G6	
	SGM7G-1A to -1E	Flexible Power cable 4 x 10.0mm ² & 2 x 1.5mm ² for brake with M40 connector	5m	JZSP-C7M385-05-E-G6	
			10 m	JZSP-C7M385-10-E-G6	
			15m	JZSP-C7M385-15-E-G6	CRUSPO CR-SCIMONE IDS Crome Raine scient Serve Rain
			20 m	JZSP-C7M385-20-E-G6	

Contents

Pin Layout for Power Cables for rotary servomotors with holding brake

JZSP-C7M344-xx-E-G6



Connector: SF-5ES1N8A80A3S (1618196) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	+	Black
4	-	White
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M354-xx-E-G6



Connector: SF-5ES1N8A80A3S (1618195) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	+	Black
4	-	White
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M364-xx-E-G6



Connector: SF-5ES1N8A8LB2S (1618199) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
1	V	Black wire 2
2	-	Black (L=150)
4	-	Black (L=150)
5	U	Black wire 1
6	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M375-xx-E-G6



Connector: SM-5ES1N8A8L32S (1613428) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
V	V	Black wire 2
+	+	Black wire 1.50
-	-	Black wire 1.50
U	U	Black wire 1
W	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

JZSP-C7M385-xx-E-G6



Connector: SM-5ES1N8A8L33S (1613429) From Phoenix Contact GmbH & Co. KG

Pin No.	Function	Wire Color
V	V	Black wire 2
+	+	Black
-	-	White
U	U	Black wire 1
W	W	Black wire 3
PE (3)	PE	Green-yellow
Housing		Shield

Cable & connector type	Length	Sigma-7 cable for absolute encoder*	Sigma-7 cable for incremental encoder	Appearance
Flexible Encoder cable with straight connector M12	3m	JZSP-C7PA2M-03-E-G□	JZSP-C7PI2M-03-E-G6	
	5m	JZSP-C7PA2M-05-E-G□	JZSP-C7PI2M-05-E-G6	
	10 m	JZSP-C7PA2M-10-E-G□	JZSP-C7PI2M-10-E-G6	
	15 m	JZSP-C7PA2M-15-E-G□	JZSP-C7PI2M-15-E-G6	
	20 m	JZSP-C7PA2M-20-E-G□	JZSP-C7PI2M-20-E-G6	
Flexible Encoder cable with angled connector M12	3m	JZSP-C7PA2N-03-E-G	JZSP-C7PI2N-03-E-G6	
	5m	JZSP-C7PA2N-05-E-G	JZSP-C7PI2N-05-E-G6	38
	10 m	JZSP-C7PA2N-10-E-G	JZSP-C7PI2N-10-E-G6	
	15 m	JZSP-C7PA2N-15-E-G	JZSP-C7PI2N-15-E-G6	
	20 m	JZSP-C7PA2N-20-E-G	JZSP-C7PI2N-20-E-G6	
Sigma-7 Extension for Encoder cable with Con- nectors length 0.3m for Abs. Encoder	0.3 m	JZSP-CSP12-E-G5	-	SERVOPACK End 0.3 m Encoder End Battery Case (Battery attached)

Encoder cables for rotary servomotors

* Sigma-7 cables for absolute encoders have a battery case (Battery attached). Currently under preparation.

Motor Connection Shielding Clamp

Shielding clamp mountable on Sigma-7 400 V SERVOPACKs up to 15 kW. Contact your YASKAWA representative for more information.

SERVOPACK Model	Order No.	Specification
Sigma-7 400V up to 3.0kW	KLBUE 4-13.5_SC	
Sigma-7 400V from 5kW up to 7.5kW	KLBUE 10-20_SC	B
Sigma-7 400V for 11 kW & 15 kW	KLBUE 15-32_SC	