YASKAWA

AC SERVO DRIVES Σ -7 SERIES

Servopacks



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SERVOPACKs

Features Σ -7 S SERVOPACKs (Single-axis)
 Analog Voltage/Pulse Train Reference Type 326 3.1 kHz response frequency and improved vibration suppression
MECHATROLINK-II Communications Reference Type
MECHATROLINK-III Communications Reference Type
 INDEXER Module-Mounted Type
 DeviceNet Module-Mounted Type
FT82/FT83 Specification (SGM7D Motor Drive Type)
$\it \Sigma ext{-}7W$ SERVOPACKs (Two-axis)
MECHATROLINK-III Communications Reference Type
$\varSigma ext{-}7C$ SERVOPACKs (Two-axis, with built-in Controllers)
 Bus Connection Reference Type
Common
SERVOPACK External Dimensions

 Σ -7S Analog Σ -7S M-III Σ -7S M-III Σ -7S INDEXER Σ -7S DeviceNet Σ -7S FT82 Σ -7S FT83 Σ -7W M-III Σ -7C SERVOPACK External Dimensions Peripheral Devices

Σ-7S Single-axis Analog Voltage/Pulse Train Reference SERVOPACKs

Model Designations















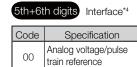
Σ -7S SERVOPACKs 1st+2nd+3rd digits

Maximum Applicable Motor Capacity

Voltage	Code	Specification
	R70*1	0.05 kW
	R90*1	0.1 kW
	1R6*1	0.2 kW
	2R8*1	0.4 kW
	3R8	0.5 kW
	5R5*1	0.75 kW
Three-	7R6	1.0 kW
phase,	120*2	1.5 kW
200 VAC	180	2.0 kW
VAC	200*3	3.0 kW
	330	5.0 kW
	470	6.0 kW
	550	7.5 kW
	590	11 kW
	780	15 kW
Cinala	R70	0.05 kW
Single- phase,	R90	0.1 kW
100 VAC	2R1	0.2 kW
,	2R8	0.4 kW

4th digit Voltage

Code	Specification
Α	200 VAC
F	100 VAC





8th+9th+10th digits Specification

opeomodion							
Code	Specification	Applicable Models					
None	Without options	All models					
000	Without options	All Thodels					
	Rack-mounted	SGD7S-R70A to -330A					
001	Tidor modified	SGD7S-R70F to -2R8F					
	Duct-ventilated	SGD7S-470A to -780A					
002	Varnished	All models					
800	Single-phase, 200-VAC power supply input	SGD7S-120A					
	No dynamia braka	SGD7S-R70A to -2R8A					
020*5	No dynamic brake	SGD7S-R70F to -2R8F					
	External dynamic brake resistor	SGD7S-3R8A to -780A					



Code None 000

	Specification	
No	one	

14th digit BTO Specification*6 (Available in Japan only)

Code	Specification
None	None
В	BTO Specification

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A00A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- st4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

N	Model SGD7S	i-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum App	licable Motor Ca	apacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0
Continuous (Dutput Curren	it [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous M	laximum Output C	Current (Arms)	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supp	oly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	-
Circuit	Input Curren	nt [Arms]*	0.4	8.0	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supp	oly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	
Control	Input Curren	nt [Arms]*	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Suppl	y Capacity [k\	VA]*	0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regenerative Resistor Power Loss [W]		_	_	_	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
Demonstra	Built-In Regenerative	Resistance $[\Omega]$	-	-	_	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	_	_	_	-	40	40	40	60	60	60	180
1 16313101	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	40	40	20	12	12	8
Overvoltage	Category							III					

 $[\]ensuremath{^{*}}$ This is the net value at the rated load.

	Model SGD7S-	470A	550A	590A	780A	
Maximum Applicable Motor Capacity [kW]			6.0	7.5	11	15
Continuous Out	put Current [Arms]	46.9	54.7	58.6	78.0
Instantaneous N	Maximum Output C	Current [Arms]	110	130	140	170
Main Cinavit	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [A	rms]*1	29	37	54	73
Control	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Control	Input Current [A	rms]*1	0.3	0.3	0.4	0.4
Power Supply C	Capacity [kVA]*1		10.7	14.6	21.7	29.6
	Main Circuit Pov	wer Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit F	Power Loss [W]	21	21	28	28
Power Loss*1	External Regene Unit Power Loss		180*2	180*3	350*3	350*³
	Total Power Los	s [W]	292.7	347.9	393.3	529.4
	External	Resistance $[\Omega]$	6.25*2	3.13 ^{*3}	3.13 ^{*3}	3.13*3
External Regenerative Resistor Unit	Regenerative Resistor Unit	Capacity [W]	880*2	1760*3	1760*3	1760*3
	Minimum Allowable External Resistance [Ω]		5.8	2.9	2.9	2.9
Overvoltage Cat	tegory				İl	

^{*1.} This is the net value at the rated load.

^{*2.} This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

^{*3.} This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

♦ Single-phase, 200 VAC

Model SGD7S-			R70A	R90A	1R6A	2R8A	5R5A	120A
Maximum Applicable Motor Capacity [kW]			0.05	0.1	0.2	0.4	0.75	1.5
Continuous Ou	utput Current [Ar	ms]	0.66	0.91	1.6	2.8	5.5	11.6
Instantaneous I	Maximum Output	Current [Arms]	2.1	3.2	5.9	9.3	16.9	28
Main Circuit	Power Supply		200	VAC to 240	O VAC, -15	% to +10%	%, 50 Hz/6	0 Hz
Main Circuit	Input Current [Arms]*	0.8	1.6	2.4	5.0	8.7	16
Control	Power Supply		200	VAC to 240	VAC, -15	% to +10%	%, 50 Hz/6	0 Hz
Control	Input Current [Arms]*	0.2	0.2	0.2	0.2	0.2	0.25
Power Supply	Capacity [kVA]*		0.2	0.3	0.6	1.2	1.9	4.0
	Main Circuit Power Loss [W]		5.0	7.1	12.1	23.7	39.2	71.8
	Control Circuit Power Loss [W]		12	12	12	12	14	16
Power Loss*	Built-in Regenerative Resistor Power Loss [W]		_	_	_	_	8	16
	Total Power Loss [W]		17.0	19.1	24.1	35.7	61.2	103.8
	Built-In	Resistance $[\Omega]$	_	_	_	_	40	12
Regenerative Resistor	Regenerative Resistor	Capacity [W]	_	_	_	_	40	60
nesisiui	Minimum Allowable External Resistance $[\Omega]$		40	40	40	40	40	12
Overvoltage Ca	Overvoltage Category			III				

^{*} This is the net value at the rated load.

♦ 270 VDC

Model SGD7S-			R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	
Maximum Appli	cable Motor Capacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	
Continuous Out	tput Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	
Instantaneous M	laximum Output Current [Arms]	2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0	
Main Circuit	Power Supply	270 VDC to 324 VDC, -15% to +10%								
Main Gircuit	Input Current [Arms]*1	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11	
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%								
Control	Input Current [Arms]*1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2	
Power Supply (Capacity [kVA]*1	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2	
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8	
Power Loss*1	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15	
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8	
Overvoltage Category					I	1	•			

^{*1.} This is the net value at the rated load.

^{*2.} The value is 0.25 Arms for the SGD7S-120A00A008.

Model SGD7S-			330A	470A	550A	590A	780A	
cable Motor Capacity [kW]	2.0	3.0	5.0	6.0	7.5	11.0	15.0	
out Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0	
aximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170	
Power Supply		270 \	/DC to 32	24 VDC, -	-15% to -	+10%		
Input Current [Arms]*	14	20	34	36	48	68	92	
Power Supply	270 VDC to 324 VDC, -15% to +10%							
Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4	
apacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6	
Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4	
Control Circuit Power Loss [W]	16	16	19	21	21	28	28	
Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4	
Overvoltage Category				III				
	able Motor Capacity [kW] out Current [Arms] eximum Output Current [Arms] Power Supply Input Current [Arms]* Power Supply Input Current [Arms]* apacity [kVA]* Main Circuit Power Loss [W] Total Power Loss [W]	able Motor Capacity [kW] 2.0 out Current [Arms] 18.5 eximum Output Current [Arms] 42.0 Power Supply Input Current [Arms]* 14 Power Supply Input Current [Arms]* 0.25 apacity [kVA]* 4.0 Main Circuit Power Loss [W] 82.7 Control Circuit Power Loss [W] 98.7	able Motor Capacity [kW] 2.0 3.0 out Current [Arms] 18.5 19.6 eximum Output Current [Arms] 42.0 56.0 Power Supply 270 V Input Current [Arms]* 14 20 Power Supply 270 V Input Current [Arms]* 0.25 0.25 apacity [kVA]* 4.0 5.9 Main Circuit Power Loss [W] 82.7 83.5 Control Circuit Power Loss [W] 98.7 99.5	able Motor Capacity [kW] 2.0 3.0 5.0 out Current [Arms] 18.5 19.6 32.9 eximum Output Current [Arms] 42.0 56.0 84.0 Power Supply 270 VDC to 32 Input Current [Arms]* 14 20 34 Power Supply 270 VDC to 32 Input Current [Arms]* 0.25 0.25 0.3 apacity [kVA]* 4.0 5.9 7.5 Main Circuit Power Loss [W] 82.7 83.5 146.2 Control Circuit Power Loss [W] 98.7 99.5 165.2	able Motor Capacity [kW] 2.0 3.0 5.0 6.0 out Current [Arms] 18.5 19.6 32.9 46.9 eximum Output Current [Arms] 42.0 56.0 84.0 110 Power Supply 270 VDC to 324 VDC, - Input Current [Arms]* 14 20 34 36 Power Supply 270 VDC to 324 VDC, - Input Current [Arms]* 0.25 0.25 0.3 0.3 apacity [kVA]* 4.0 5.9 7.5 10.7 Main Circuit Power Loss [W] 82.7 83.5 146.2 211.6 Control Circuit Power Loss [W] 98.7 99.5 165.2 232.6	able Motor Capacity [kW] 2.0 3.0 5.0 6.0 7.5 out Current [Arms] 18.5 19.6 32.9 46.9 54.7 eximum Output Current [Arms] 42.0 56.0 84.0 110 130 Power Supply 270 VDC to 324 VDC, -15% to -10 10 10 10 10 10 10 10 10 10 10 10 10 1	able Motor Capacity [kW] 2.0 3.0 5.0 6.0 7.5 11.0 out Current [Arms] 18.5 19.6 32.9 46.9 54.7 58.6 aximum Output Current [Arms] 42.0 56.0 84.0 110 130 140 Power Supply 270 VDC to 324 VDC, -15% to +10% Input Current [Arms]* 14 20 34 36 48 68 Power Supply 270 VDC to 324 VDC, -15% to +10% Input Current [Arms]* 0.25 0.25 0.3 0.3 0.3 0.4 apacity [kVA]* 4.0 5.9 7.5 10.7 14.6 21.7 Main Circuit Power Loss [W] 82.7 83.5 146.2 211.6 255.3 243.6 Control Circuit Power Loss [W] 98.7 99.5 165.2 232.6 276.3 271.6	

 $[\]boldsymbol{*}$ This is the net value at the rated load.

◆ Single-phase, 100 VAC

	Model SGD7S-	R70F	R90F	2R1F	2R8F
Maximum App	licable Motor Capacity [kW]	0.05	0.1	0.2	0.4
Continuous Ou	utput Current [Arms]	0.66	0.91	2.1	2.8
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3
Main Circuit	Power Supply	o 120 VAC, -15	% to +10%, 50	Hz/60 Hz	
Iviairi Oilcuit	Input Current [Arms]*	1.5	2.5	5	10
Control	Power Supply	oply 100 VAC to 120 VAC, -159			Hz/60 Hz
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12
	Total Power Loss [W]	17.3	19.8	26.2	38.2
Regenerative Resistor	Minimum Allowable External Resistance [Ω]	40	40	40	40
Overvoltage C	ategory		I	II	

^{*} This is the net value at the rated load.

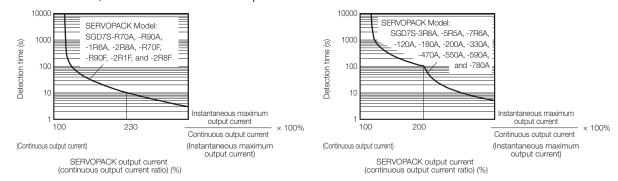
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

	Item			Specification			
С	ontrol Method	IGBT-based PWM control, sine wave current drive					
ack	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)					
Feedback	With Linear Servomotor	absolute • Increme	linear encoder ntal linear enco	(The signal resolution depends on the .) der (The signal resolution depends on the der or Serial Converter Unit.)			
	Surrounding Air Temperature*1	Refer to th	ting, usage is p	ossible between 55°C and 60°C. ction for derating specifications. s (page 333)			
	Storage Temperature	-20°C to 85°C					
	Surrounding Air Humidity Storage Humidity	95% relative humidity max. (with no freezing or condensation) 95% relative humidity max. (with no freezing or condensation)					
	Vibration Resistance	4.9 m/s ²					
SI	Shock Resistance	19.6 m/s ²					
ditior		Class		SERVOPACK Model: SGD7S-			
Environmental Conditions	Degree of Protection	IP20	R70A, R90A, R70F, R90F, 2	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 2R1F, 2R8F			
nment		IP10	120A00A008, 180A, 200A, 330A, 470A, 550A, 59				
Enviro	Pollution Degree	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 					
	Altitude*1	1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. **Derating Specifications* (page 333)*					
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity					
Ap	oplicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 201 EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1					
		M	ounting	SERVOPACK Model: SGD7S-			
		Base-mo	unted	All Models			
M	ounting	Rack-mo	unted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F			
		Duct-ven	tilated	470A, 550A, 590A, 780A			
	Speed Control Range	,		ue, the lower limit of the speed control range omotor to stop.)			
Ce	Coefficient of Speed	±0.01% of	frated speed m	nax. (for a load fluctuation of 0% to 100%)			
nar	Coefficient of Speed Fluctuation*2	0% of rate	ed speed max.	(for a voltage fluctuation of ±10%)			
Performance		±0.1% of r	ated speed max	x. (for a temperature fluctuation of 25°C ±25°C)			
Per	Torque Control Precision (Repeatability)	±1%					
	Soft Start Time Setting	0 s to 10 s	s (Can be set se	eparately for acceleration and deceleration.)			
	<u> </u>	1		Continued on next pac			

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			Continued from previous page.					
		Item	Specification					
	Er	ncoder Divided Pulse Output	Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.					
	O۱	verheat Protection Input	Number of input points: 1 Input voltage range: 0 V to +5 V					
		Fixed Input	Allowable voltage range: 5 VDC ±5% Number of input points: 1 Absolute Data Request (SEN)					
I/O Signals	Sequence Input Signals	Input Signals That Can Be Allocated	Allowable voltage range: 24 VDC ±20% Number of input points: 7 Input method: Sink inputs or source inputs Input Signals • /S-ON (Servo ON) signal • /P-CON (Proportional Control) Signal • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /ALM-RST (Alarm Reset) signal • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /SPD-D (Motor Direction) signal • /SPD-A and /SPD-B (Internal Set Speed Selection) signals • /C-SEL (Control Selection) signal • /ZCLAMP (Zero Clamping) signal • /INHIBIT (Reference Pulse Inhibit) signal • /G-SEL (Gain Selection) signal • /P-DET (Polarity Detection) signal • /P-DET (Reference Pulse Input Multiplication Switch) Signal • /PSEL (Reference Pulse Input Multiplication Switch) Signal • FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed.					
		Fixed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: Servo Alarm (ALM)					
	Sequence Output Signals	Output Signals That Can Be Allocated	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 6 (A photocoupler output (isolated) is used for three of the outputs.) (An open-collector output (non-isolated) is used for the other three outputs.) Output Signals · /COIN (Positioning Completion) Signal · /V-CMP (Speed Coincidence Detection) Signal · /TGON (Rotation Detection) Signal · /S-RDY (Servo Ready) signal · /CLT (Torque Limit Detection) Signal · /VLT (Speed Limit Detection) Signal · /WAR (Brake) signal · /WARN (Warning) Signal · /WARN (Warning) Signal · /PSELA (Reference Pulse Input Multiplication Switching Output) signal · ALO1, ALO2, and ALO3 (Alarm Code) signals A signal can be allocated and the positive and negative logic can be changed.					
	S	g Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)					
တ	22A	1:N Communications	Up to N = 15 stations possible for RS-422A port					
Communications	RS-4	Interfaces 1:N Communications Axis Address Setting	Set with parameters.					
nuni	9	g Interface	Personal computer (with SigmaWin+)					
Comn	USB	Interface Communications Standard	Conforms to USB2.0 standard (12 Mbps).					
		ays/Indicators	CHARGE indicator and five-digit seven-segment display					
_	_							

Continued from previous page.

	Item				Continued from previous page. Specification				
Panel Operator					•				
Panel Operator			erat	or	Four push switches				
Ar	Analog Monitor (CN5)			or (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)				
Dy	Dynamic Brake (DB)			ke (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.				
Re	eger	nera	tive	Processing	Built-in (An external resistor must be connected to the SGD7S-470A to -780A.) **Built-In Regenerative Resistor* (page 472)				
0	verti	rave	I (O	T) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal				
Pr	Protective Functions		nctions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.					
Ut	Utility Functions		ns	Gain adjustment, alarm history, jogging, origin search, etc.					
_	Applicable Standards*3		;	/HWBB1 and /HWBB2: Base block signals for Power Modules					
afet			ıtpu	t	EDM1: Monitors the status of built-in safety circuit (fixed output).				
ഗ്	Fun	Ap	pplicable Standards*3		ISO13849-1 PLe (Category 3) and IEC61508 SIL3				
	Option Module			Fully-Closed Modules and Safety Modules					
O	otioi	n IVI	Module		Note: You cannot use a Fully-Closed Module and a Safety Module together.				
		Sc	Soft Start Time Setting		0 s to 10 s (Can be set separately for acceleration and deceleration				
	10	Ħ	lal	Reference Voltage	 Maximum input voltage: ±12 V (forward motor rotation for positive reference). 6 VDC at rated speed (default setting). Input gain setting can be changed. 				
	ont	Input	Sigr	Input Impedance	Approx. 14 kΩ				
	C			Circuit Time Constant	30 μs				
	Speed Control	al Set	tog	Rotation Direction Selection	With Proportional Control signal				
		Internal Se			With Forward/Reverse External Torque Limit signals (speed 1 to 3 selection). Servomotor stops or another control method is used when both signals are OFF.				
		Fe	edf	orward Compensation	0% to 100%				
			•	t Signal Positioning leted Width Setting	0 to 1,073,741,824 reference units				
slo	_			Reference Pulse Form	One of the following is selected: Sign + pulse train, CW + CCW pulse trains, and two-phase pulse trains with 90° phase differential				
Controls	ntrc		pulses	Input Form	Line driver or open collector				
S	Position Control	Input Signals	Reference pul	Maximum Input Frequency	 Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mpps Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps 				
				Input Multiplication Switching	1 to 100 times				
			Cl	ear Signal	Position deviation clear Line driver or open collector				
	Torque Control	ut Signal	Re	eference Voltage	 Maximum input voltage: ±12 V (forward torque output for positive reference). 3 VDC at rated torque (default setting). Input gain setting can be changed. 				
	orqu	Input	Inp	out Impedance	Approx. 14 k Ω				
	70		Ci	rcuit Time Constant	16 μs				

- *1. If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable range cannot be increased by derating.
- *2. The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = No-load motor speed - Total-load motor speed × 100%

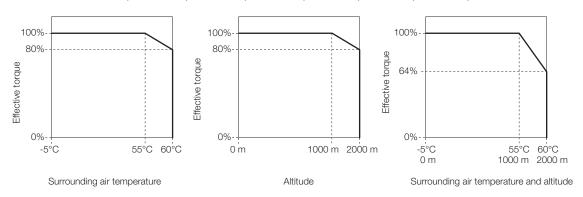
Rated motor speed

*3. Always perform risk assessment for the system and confirm that the safety requirements are met.

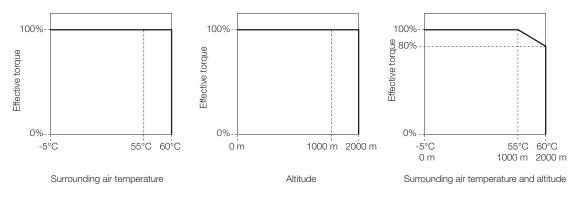
Derating Specifications

If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

◆ SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F

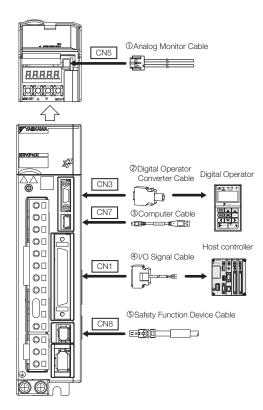


◆ SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -470A, -550A, -590A, and -780A



Selecting Cables

◆ System Configurations



◆ Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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
 - Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name		Length (L)	Order Number	Appearance	
0	Analog Monitor Cable		1 m	JZSP-CA01-E		
2	Digital Opera Cable	tor Converter	0.3 m	JZSP-CVS05-A3-E*1		
3	Computer Ca	able	2.5 m	JZSP-CVS06-02-E		
		Soldered Connector k		JZSP-CSI9-1-E		
		Connector- Terminal Block Con- verter Unit (with cable) Cable with Loose Wires	0.5 m	JUSP-TA50PG-E		
			1 m	JUSP-TA50PG-1-E		
4	I/O Signal Cables		2 m	JUSP-TA50PG-2-E		
			1 m	JZSP-CSI01-1-E		
		at One End (loose wires	2 m	JZSP-CSI01-2-E		
		on peripheral device end)	3 m	JZSP-CSI01-3-E		
		Cables with	1 m	JZSP-CVH03-01-E	L	
	Safety Function	Connectors*2	3 m	JZSP-CVH03-03-E	- 400	
⑤ 	Device Cables	Connector Kit*3		Contact Tyco Electronics Japan G.K. Product name: Industrial Mini I/O D-shape Type 1 Plug Connector Kit Model number: 2013595-1		

^{*1.} This Converter Cable is required to use the Σ-III-series Digital Operator (JUSP-OP05A) for Σ-7-series SERVO-PACKs.

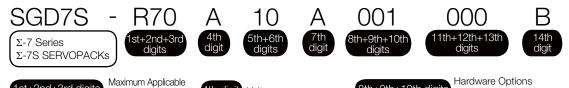
^{*2.} When using safety functions, connect this Cable to the safety function devices.

When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

^{*3.} Use the Connector Kit when you make cables yourself.

Σ -7S Single-axis MECHATROLINK-II Communications Reference SERVOPACKs

Model Designations



1st+2nd+3rd digits Motor Capacity							
Voltage	Code	Specification					
	R70*1	0.05 kW					
	R90*1	0.1 kW					
	1R6*1	0.2 kW					
	2R8*1	0.4 kW					
Three-	3R8	0.5 kW					
phase, 200	5R5*1	0.75 kW					
VAC	7R6	1.0 kW					
	120*2	1.5 kW					
	180	2.0 kW					
	200*3	3.0 kW					
	330	5.0 kW					
	470	6.0 kW					
	550	7.5 kW					
	590	11 kW					
	780	15 kW					
	R70	0.05 kW					
Single- phase,	R90	0.1 kW					
100 VAC	2R1	0.2 kW					
	2R8	0.4 kW					

4th digit Voltage						
Code	Specification					
Α	200 VAC					
F	100 VAC					
5th+6t	h digits Interface*4					
Code	Specification					
10	MECHATROLINK-II communications reference					
7th dig A	it Design Revision Order					

8th+9th+10th digits Specification								
Code	Specification	Applicable Models						
None	\A/ithau it austiaus	All mandala						
000	Without options	All models						
	Rack-mounted	SGD7S-R70A to -330A						
001	Tidok modifica	SGD7S-R70F to -2R8F						
	Duct-ventilated	SGD7S-470A to -780A						
002	Varnished	All models						
008	Single-phase, 200-VAC power supply input	SGD7S-120A						
020*5	No dynamic brake	SGD7S-R70A to -2R8A SGD7S-R70F to -2R8F						
	External dynamic brake resistor	SGD7S-3R8A to -780A						

11th+	12th+13th digits FT/E	X Specification
Code	Specification	
None	None	

14th digit		BTO Specification*6 (Available in Japan	
	Code	Specification	

Code	Specification
None	None
В	BTO Specification

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A10A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

N	1odel SGD7S	-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum Applicable Motor Capacity [kW]		0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	
Continuous (Dutput Curren	t [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous M	aximum Output C	urrent [Arms]	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	-
Circuit	Input Curren	ıt [Arms]*	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	
Control	Input Curren	it [Arms]*	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Suppl	y Capacity [k\	/A]*	0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regenerative Resistor Power Loss [W]		_	-	_	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
	Built-In Regenerative	Resistance $[\Omega]$	_	_	_	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	-	_	_	_	40	40	40	60	60	60	180
TIGGIGLOT	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	40	40	20	12	12	8
Overvoltage	Category			•	•	•		III	•	•	•	•	

^{*} This is the net value at the rated load.

	470A	550A	590A	780A		
Maximum Applicable Motor Capacity [kW]			6.0	7.5	11	15
Continuous Out	out Current [Arms]	46.9	54.7	58.6	78.0
Instantaneous M	1aximum Output C	Current [Arms]	110	130	140	170
Main Cinavit	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [A	rms]*1	29	37	54	73
Control Power Supply Input Current [Arms]*1		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz	
		rms]*1	0.3	0.3	0.4	0.4
Power Supply Capacity [kVA]*1			10.7	14.6	21.7	29.6
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit F	Power Loss [W]	21	21	28	28
Power Loss*1	External Regenerative Resistor Unit Power Loss [W]		180*2	180*3	350*3	350*³
	Total Power Loss [W]		292.7	347.9	393.3	529.4
	External	Resistance $[\Omega]$	6.25*2	3.13 ^{*3}	3.13 ^{*3}	3.13 ^{*3}
External Regenerative	Regenerative Resistor Unit	Capacity [W]	880*2	1760*³	1760*³	1760*³
Resistor Unit	Minimum Allowable External Resistance [Ω]		5.8	2.9	2.9	2.9
Overvoltage Category			III			

^{*1.} This is the net value at the rated load.

^{*2.} This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

^{*3.} This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

♦ Single-phase, 200 VAC

Model SGD7S-				R90A	1R6A	2R8A	5R5A	120A
Maximum Applicable Motor Capacity [kW]			0.05	0.1	0.2	0.4	0.75	1.5
Continuous Ou	itput Current [Ar	ms]	0.66	0.91	1.6	2.8	5.5	11.6
Instantaneous I	Maximum Output	Current [Arms]	2.1	3.2	5.9	9.3	16.9	28
Main Circuit	Power Supply		200	VAC to 240	O VAC, -15	% to +10%	%, 50 Hz/6	0 Hz
Main Circuit	Input Current [Arms]*		0.8	1.6	2.4	5.0	8.7	16
Power Supply		200	VAC to 240	VAC, -15	% to +10%	%, 50 Hz/6	0 Hz	
Control	Input Current [Arms]*		0.2	0.2	0.2	0.2	0.2	0.25
Power Supply Capacity [kVA]*			0.2	0.3	0.6	1.2	1.9	4.0
	Main Circuit Power Loss [W]		5.0	7.1	12.1	23.7	39.2	71.8
	Control Circuit Power Loss [W]		12	12	12	12	14	16
Power Loss*	Built-in Regenerative Resistor Power Loss [W]		-	_	-	_	8	16
	Total Power Loss [W]		17.0	19.1	24.1	35.7	61.2	103.8
	Built-In	Resistance $[\Omega]$	_	_	_	_	40	12
Regenerative Resistor	Regenerative Resistor	Capacity [W]	_	_	_	_	40	60
UESISTOI	Minimum Allow Resistance $[\Omega]$		40	40	40	40	40	12
Overvoltage Ca	ategory				I			

^{*} This is the net value at the rated load.

♦ 270 VDC

Model SGD7S-			R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A
Maximum Applicable Motor Capacity [kW]			0.1	0.2	0.4	0.5	0.75	1.0	1.5
Continuous Output Current [Arms]			0.91	1.6	2.8	3.8	5.5	7.6	11.6
Instantaneous Maximum Output Current [Arms]		2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0
Power Supply			270	VDC to	324 VI	DC, -15	% to +1	0%	
Main Circuit	Input Current [Arms]*1	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%							
Control	Input Current [Arms]*1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2
Power Supply Capacity [kVA]*1			0.3	0.6	1	1.4	1.6	2.3	3.2
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8
Power Loss*1	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8
Overvoltage Category					I	II			

^{*1.} This is the net value at the rated load.

 $^{^{*2}}$. The value is 0.25 Arms for the SGD7S-120A00A008.

Model SGD7S-			200A	330A	470A	550A	590A	780A
Maximum Applicable Motor Capacity [kW]			3.0	5.0	6.0	7.5	11.0	15.0
Continuous Output Current [Arms]			19.6	32.9	46.9	54.7	58.6	78.0
Instantaneous Maximum Output Current [Arms]		42.0	56.0	84.0	110	130	140	170
Main Circuit Power Supply			270 \	/DC to 32	24 VDC,	-15% to -	+10%	
Maii Circuit	Input Current [Arms]*	14	20	34	36	48	68	92
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%						
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4
Power Supply (4.0	5.9	7.5	10.7	14.6	21.7	29.6	
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4
Overvoltage Ca				III			<u> </u>	

^{*} This is the net value at the rated load.

Single-phase, 100 VAC

	Model SGD7S-	R70F	R90F	2R1F	2R8F	
Maximum Applicable Motor Capacity [kW]		0.05	0.1	0.2	0.4	
Continuous Output Current [Arms]		0.66	0.91	2.1	2.8	
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3	
Main Circuit	Power Supply	100 VAC t	o 120 VAC, -15	% to +10%, 50	Hz/60 Hz	
Iviaii i Circuit	Input Current [Arms]*	1.5	2.5	5	10	
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz				
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38	
Power Supply Capacity [kVA]*		0.2	0.3	0.6	1.4	
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2	
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12	
	Total Power Loss [W]	17.3	19.8	26.2	38.2	
Regenerative Resistor	9		40	40	40	
Overvoltage Category			I	II		

^{*} This is the net value at the rated load.

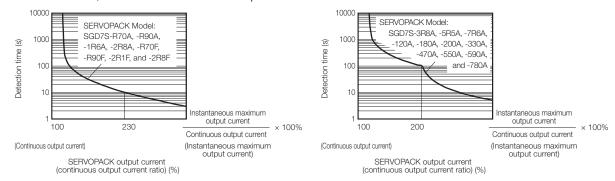
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

Stora Surro Stora Shoo Degral Pollu Altitu	Method n Rotary Servomotor n Linear Servomotor rounding Air Temperature* rage Temperature rounding Air Humidity rage Humidity ration Resistance ock Resistance	Absolute absolute Incremer incremer -5°C to 55 With derat Refer to the Deration -20°C to 8 95% relatives	oder: 17 bits (ab 20 bits or 2 22 bits (ab e linear encoder. Intal	der (The signal resolution depends on the der or Serial Converter Unit.) possible between 55°C and 60°C. tion for derating specifications. (a) (page 343) x. (with no freezing or condensation) (x. (with no freezing or condensation) SERVOPACK Model: SGD7S-1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Stora Surro Stora Shoo Degral Pollu Altitu	rounding Air Temperature*1 rage Temperature rounding Air Humidity rage Humidity ration Resistance ock Resistance	Absolute absolute Incremer incremer -5°C to 55 With derat Refer to the Poration of the Poration o	20 bits or 2 22 bits (at 22 bits (at 22 bits (at 22 bits (at 24 bi	24 bits (incremental encoder/absolute encoder) osolute encoder) (The signal resolution depends on the) der (The signal resolution depends on the der or Serial Converter Unit.) cossible between 55°C and 60°C. tion for derating specifications. (page 343) x. (with no freezing or condensation) x. (with no freezing or condensation) SERVOPACK Model: SGD7S-1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Stora Stora Stora Stora Stora Stora Stora Shoo Shoo Applicable	rounding Air Temperature*1 rage Temperature rounding Air Humidity rage Humidity ration Resistance ock Resistance	absolute Incremer incremer -5°C to 55 With derat Refer to th Deration -20°C to 8 95% relation 95% relation 4.9 m/s² 19.6 m/s² Class IP20	linear encoder. Intal linear encoder. Intel	der (The signal resolution depends on the der or Serial Converter Unit.) possible between 55°C and 60°C. tion for derating specifications. (a) (page 343) x. (with no freezing or condensation) x. (with no freezing or condensation) SERVOPACK Model: SGD7S- 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Stora Surro Stora Vibra Shoo Shoo Applicable Applicable	rage Temperature rounding Air Humidity rage Humidity ration Resistance ock Resistance	With derat Refer to the Paration of the Parati	ing, usage is pose following secting Specifications 55°C we humidity maxive humidity maxive humidity maxive for following the following section in the following section is presented by the following section in the following section is presented by the following section in the following section is presented by the following section in the following section is presented by the following section in the following section is presented by the following section in the following section is presented by the following section is p	tion for derating specifications. (page 343) x. (with no freezing or condensation) x. (with no freezing or condensation) SERVOPACK Model: SGD7S- 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Stora Vibra Shoo Shoo Degr Pollu Altitu Othe	rounding Air Humidity rage Humidity ration Resistance ock Resistance	95% relative 95% relative 4.9 m/s ² 19.6 m/s ² Class IP20	ve humidity max ve humidity max R70A, R90A, R70F, R90F, 2	SERVOPACK Model: SGD7S-1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Stora Vibra Shoo Shoo Shoo Applicable Applicable	rage Humidity ration Resistance ock Resistance	95% relative 4.9 m/s ² 19.6 m/s ² Class IP20	R70A, R90A, R70F, R90F, 2	SERVOPACK Model: SGD7S-1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Vibra Shoo Shoo Degri Pollu Altitu	ration Resistance ock Resistance	4.9 m/s ² 19.6 m/s ² Class IP20	R70A, R90A, R70F, R90F, 2	SERVOPACK Model: SGD7S- 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Shoo Shoo Degr	ock Resistance	19.6 m/s ² Class IP20	R70A, R90A, R70F, R90F, 2	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Pollu Altitu Othe		Class IP20	R70A, R90A, R70F, R90F, 2	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Altitu	gree of Protection	IP20	R70A, R90A, R70F, R90F, 2	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Altitu	gree of Protection	IP20	R70A, R90A, R70F, R90F, 2	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Altitu		IP10		2R1F, 2R8F			
Altitu			120A10A008, 780A	180A, 200A, 330A, 470A, 550A, 590A,			
Othe	ution Degree	Must be	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 				
Applicab	ude*1	1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. **Derating Specifications** (page 343)					
	ers	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity					
N.A	ole Standards	EN 55011 EN 61800- EN 61800-	group 1 class A, 3 (Category C2,	CSA C22.2 No.274, EN ISO13849-1: 2015, , EN 61000-6-2, EN 61000-6-4, , Second environment), EN 50178, -1, IEC 61508 series, IEC 62061, 1326-3-1			
Manuatia		M	ounting	SERVOPACK Model: SGD7S-			
N 4		Base-mo		All Models			
Mounting	9	Rack-mo	ounted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F			
			ntilated	470A, 550A, 590A, 780A			
Spee			the rated torque cause the Servo	ie, the lower limit of the speed control range amotor to stop.)			
Coct	eed Control Range	±0.01% of	rated speed m	ax. (for a load fluctuation of 0% to 100%)			
		0% of rate	d speed max. (1	for a voltage fluctuation of ±10%)			
<u>ā</u>	efficient of Speed	±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)					
(Rep	efficient of Speed	±1%					
Soft	efficient of Speed ctuation*2 que Control Precision peatability)	±1%		0 s to 10 s (Can be set separately for acceleration and deceleration.)			

Continued on next page.

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			14	Continued from previous page.
			Item	Specification
	En	code	er Divided Pulse Output	Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.
		erhe	at Protection Input	Number of input points: 1
				Input voltage range: 0 V to +5 V
	als			Allowable voltage range: 24 VDC ±20% Number of input points: 7
	Sequence Input Signals	Input Signals That Can Be Allocated		Input method: Sink inputs or source inputs Input Signals • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /DEC (Origin Return Deceleration Switch) signal • /EXT1 to /EXT3 (External Latch Input 1 to 3) signals
SIS	(O)			FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed.
I/O Signals		Fixed Output		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: Servo Alarm (ALM) Allowable voltage range: 5 VDC to 30 VDC
	gnals			Number of output points: 3 (A photocoupler output (isolated) is used.)
	Sequence Output Signals	Output Signals That Can Be Allocated		Output Signals • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /BK (Brake) signal • /WARN (Warning) signal
				NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.
	9	2 Interfaces		Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)
	22A	callo 3)	1:N Communications	Up to N = 15 stations possible for RS-422A port
ications	RS-422A	CONTINUES (CN3)	Axis Address Setting	41 to 5F hex (maximum number of slaves: 30) Selected with the combination of a rotary switch (S2) and DIP switch (S3).
Jur	ç	2	Interface	Personal computer (with SigmaWin+)
Commur	USB	COMMINICATION (CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).
Dis	splay	s/Inc	dicators	CHARGE, PWR, and COM indicators, and one-digit seven-segment display
_		Со	mmunications Protocol	MECHATROLINK-II
I-XVI	Station Address Settings		tion Address Settings	41 to 5F hex (maximum number of slaves: 30) Selected with the combination of a rotary switch (S2) and DIP switch (S3).
MECHATROLINK-II	Communications	Bai	ud Rate	10 Mbps, 4 Mbps A DIP switch (S3) is used to select the baud rate.
Ë	ш	Tra	nsmission Cycle	250 μs or 0.5 ms to 4.0 ms (multiples of 0.5 ms)
ME	ŏ		mber of Transmission	17 or 32 bytes/station A DIP switch (S3) is used to select the number of transmission bytes.
Φ	Bytes			Position, speed, or torque control with MECHATROLINK-II communications
Reference	Method		ference Input	MECHATROLINK-I or MECHATROLINK-II commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)
			DLINK-II Communica- g Switches	Rotary switch (S2) positions: 16 Number of DIP switch (S3) pins: 4

Continued from previous page.

	Item	Specification
Analog	Monitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)
Dynamic Brake (DB)		Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.
Regenerative Processing		Built-in (An external resistor must be connected to the SGD7S-470A to -780A.) **Built-In Regenerative Resistor* (page 472)
Overtravel (OT) Prevention		Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal
Protect	ive Functions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.
Utility F	unctions	Gain adjustment, alarm history, jogging, origin search, etc.
	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules
Safety -unctions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).
S	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3
Option Module		Fully-Closed Modules and Safety Modules Note: You cannot use a Fully-Closed Module and a Safety Module together.

^{*1.} If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable range cannot be increased by derating.

Coefficient of speed fluctuation = No-load motor speed - Total-load motor speed × 100% Rated motor speed

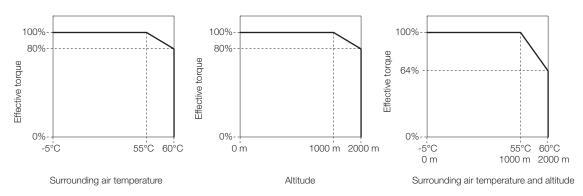
^{*2.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

^{*3.} Always perform risk assessment for the system and confirm that the safety requirements are met.

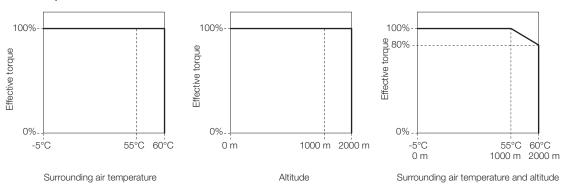
Derating Specifications

If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

◆ SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F

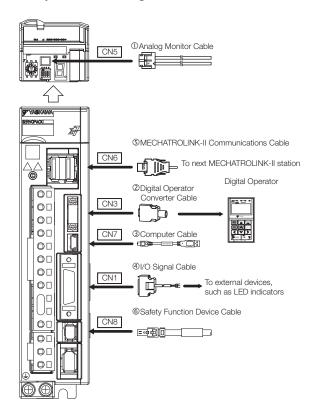


◆ SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -470A, -550A, -590A, and -780A



Selecting Cables

System Configurations



◆ Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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
- \square Σ -7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	Length (L)	Order Number	Appearance
1	Analog Monitor Cable	1 m	JZSP-CA01-E	
2	Digital Operator Converter Cable	0.3 m	JZSP-CVS05-A3-E*1	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

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Code	e Name Length (L)		Order Number	Appearance	
		Soldered Conn	ector Kit	JZSP-CSI9-2-E	
		Connector- Terminal Block Con-	0.5 m	JUSP-TA26P-E	
			1 m	JUSP-TA26P-1-E	
4	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA26P-2-E	
		Cable with Loose Wires	1 m	JZSP-CSI02-1-E	
		at One End (loose wires	2 m	JZSP-CSI02-2-E	
		on peripheral device end)	3 m	JZSP-CSI02-3-E	₫ <u></u>
			0.5 m	JEPMC-W6002-A5-E	
		Cables with Connectors on Both Ends	1 m	JEPMC-W6002-01-E	
			3 m	JEPMC-W6002-03-E	
			5 m	JEPMC-W6002-05-E	L
			10 m	JEPMC-W6002-10-E	
			20 m	JEPMC-W6002-20-E	
			30 m	JEPMC-W6002-30-E	
	MECHATRO		40 m	JEPMC-W6002-40-E	
	LINK-II		50 m	JEPMC-W6002-50-E	
(5)	Communi-	Cables with	0.5 m	JEPMC-W6003-A5-E	
	cations		1 m	JEPMC-W6003-01-E	
	Cables		3 m	JEPMC-W6003-03-E	
		Connectors	5 m	JEPMC-W6003-05-E	L L
		on Both Ends	10 m	JEPMC-W6003-10-E	
		(with ferrite cores)	20 m	JEPMC-W6003-20-E	
		Cores)	30 m	JEPMC-W6003-30-E	
			40 m	JEPMC-W6003-40-E	
			50 m	JEPMC-W6003-50-E	
		Terminators		JEPMC-W6022-E	
		Cables with	1 m	JZSP-CVH03-01-E	L L
	Safety	Connectors*2	3 m	JZSP-CVH03-03-E	三•4到[0] 3 8
6	Function Device Cables	Connector Kit*	3	Contact Tyco Electronic Product name: Industria nector Kit Model number: 201359	al Mini I/O D-shape Type 1 Plug Con-

^{*1.} This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs

^{*2.} When using safety functions, connect this Cable to the safety function devices.

When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

^{*3.} Use the Connector Kit when you make cables yourself.

Σ -7S Single-axis MECHATROLINK-III Communications Reference SERVOPACKs

Model Designations

 Σ -7 Series





1st+2nd+3rd digits

Σ-7S SERVOPACKs

Maximum Applicable Motor Capacity

Voltage	Code	Specification
	R70*1	0.05 kW
	R90*1	0.1 kW
	1R6*1	0.2 kW
	2R8*1	0.4 kW
Three-	3R8	0.5 kW
phase, 200	5R5*1	0.75 kW
VAC	7R6	1.0 kW
	120*2	1.5 kW
	180	2.0 kW
	200*3	3.0 kW
	330	5.0 kW
	470	6.0 kW
	550	7.5 kW
	590	11 kW
	780	15 kW
	R70	0.05 kW
Single-	R90	0.1 kW
phase, 100 VAC	2R1	0.2 kW
100 % 10	2R8	0.4 kW



Code	Specification
Α	200 VAC
F	100 VAC

5th+6th digits Interface*4

Code	Specification				
20	MECHATROLINK-III communications reference				



011 011 4011 11 11	Hardware Options
8th+9th+10th digits	Specification

Specification							
Code	Specification	Applicable Models					
None	\	A II I - I -					
000	Without options	All models					
	Rack-mounted	SGD7S-R70A to -330A					
001	Tidok moditiod	SGD7S-R70F to -2R8F					
	Duct-ventilated	SGD7S-470A to -780A					
002	Varnished	All models					
008	Single-phase, 200-VAC power supply input	SGD7S-120A					
	No dynamic brake	SGD7S-R70A to -2R8A					
020*5	TWO GYMAITHE BLAKE	SGD7S-R70F to -2R8F					
	External dynamic brake resistor	SGD7S-3R8A to -780A					

11th+12th+13th digits FT/EX Specification

Code	Specification						
None	None						
000	INOTIO						

BTO Specification*6 (Available in Japan only)

Code	Specification
None	None
В	BTO Specification

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A20A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
 - uct Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

Model SGD7S-			R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum Applicable Motor Capacity [kW]		0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	
Continuous (Dutput Curren	t [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous M	aximum Output C	Current [Arms]	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	
Circuit	Input Curren	t [Arms]*	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supp	ly		200	VAC .	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	
Control	Input Curren	t [Arms]*	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Suppl	y Capacity [k\	/A]*	0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regen Resistor Powe		-	-	-	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
Danasakka	Built-In Regenerative	Resistance $[\Omega]$	-	-	-	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	_	_	-	_	40	40	40	60	60	60	180
1 10010101	Minimum Allowable External Resistance $[\Omega]$		40	40	40	40	40	40	40	20	12	12	8
Overvoltage	Category							Ш					

^{*} This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A
Maximum Applicable Motor Capacity [kW]			6.0	7.5	11	15
Continuous Out	out Current [Arms]	46.9	54.7	58.6	78.0
Instantaneous M	1aximum Output C	Current [Arms]	110	130	140	170
Main Cinavit	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [A	rms]*1	29	37	54	73
Control	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Control	Input Current [A	rms]*1	0.3	0.3	0.4	0.4
Power Supply C	apacity [kVA]*1		10.7	14.6	21.7	29.6
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit F	Power Loss [W]	21	21	28	28
Power Loss*1	External Regene Unit Power Loss		180*2	180*3	350*3	350*³
	Total Power Los	s [W]	292.7	347.9	393.3	529.4
	External	Resistance $[\Omega]$	6.25*2	3.13 ^{*3}	3.13 ^{*3}	3.13 ^{*3}
External Regenerative	Regenerative Resistor Unit	Capacity [W]	880*2	1760*³	1760*³	1760*³
Resistor Unit	Minimum Allowable External Resistance [Ω]		5.8	2.9	2.9	2.9
Overvoltage Category				I	II	

^{*1.} This is the net value at the rated load.

^{*2.} This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

 $[{]m *3.}$ This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

♦ Single-phase, 200 VAC

Model SGD7S-			R70A	R90A	1R6A	2R8A	5R5A	120A
Maximum App	licable Motor Ca	pacity [kW]	0.05	0.1	0.2	0.4	0.75	1.5
Continuous Ou	utput Current [Ar	ms]	0.66	0.91	1.6	2.8	5.5	11.6
Instantaneous I	Maximum Output	Current [Arms]	2.1	3.2	5.9	9.3	16.9	28
Main Circuit	Power Supply		200	VAC to 240	O VAC, -15	% to +10%	%, 50 Hz/6	60 Hz
Main Circuit	Input Current [Arms]*	0.8	1.6	2.4	5.0	8.7	16
Control	Power Supply		200	VAC to 240	VAC, -15	% to +10%	%, 50 Hz/6	0 Hz
Control	Input Current [Arms]*	0.2	0.2	0.2	0.2	0.2	0.25
Power Supply	Capacity [kVA]*		0.2	0.3	0.6	1.2	1.9	4.0
	Main Circuit Power Loss [W]		5.0	7.1	12.1	23.7	39.2	71.8
	Control Circuit I	Power Loss [W]	12	12	12	12	14	16
Power Loss*	Built-in Regenerative Resistor Power Loss [W]		_	_	-	-	8	16
	Total Power Lo	ss [W]	17.0	19.1	24.1	35.7	61.2	103.8
	Built-In	Resistance $[\Omega]$	-	_	_	_	40	12
Regenerative Resistor	Regenerative Resistor	Capacity [W]	-	_	-	-	40	60
HESISIOI	Minimum Allowable External Resistance $[\Omega]$		40	40	40	40	40	12
Overvoltage C	ategory				I	II		+

^{*} This is the net value at the rated load.

♦ 270 VDC

Model SGD7S-			R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A
Maximum Appli	cable Motor Capacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5
Continuous Out	put Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6
Instantaneous M	1aximum Output Current [Arms]	2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0
Main Circuit	Power Supply		270	VDC to	324 VI	DC, -15	% to +1	0%	
Main Gircuit	Input Current [Arms]*1	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%							
Control	Input Current [Arms]*1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2
Power Supply (Capacity [kVA]*1	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8
Power Loss*1	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15
Total Power Loss [W]		16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8
Overvoltage Ca	tegory				l				

^{*1.} This is the net value at the rated load.

^{*2.} The value is 0.25 Arms for the SGD7S-120A00A008.

	Model SGD7S-	180A	200A	330A	470A	550A	590A	780A	
Maximum Appl	icable Motor Capacity [kW]	2.0	3.0	5.0	6.0	7.5	11.0	15.0	
Continuous Ou	tput Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0	
Instantaneous N	Maximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170	
Main Circuit	Power Supply		270 \	/DC to 32	24 VDC,	-15% to -	+10%		
Iviaii i Gircuit	Input Current [Arms]*	14	20	34	36	48	68	92	
Control	Power Supply	270 VDC to 324 VDC, -15% to +10%							
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4	
Power Supply (Capacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6	
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4	
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28	
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4	
Overvoltage Ca	ategory		•		III			<u> </u>	

^{*} This is the net value at the rated load.

Single-phase, 100 VAC

	Model SGD7S-	R70F	R90F	2R1F	2R8F			
Maximum App	licable Motor Capacity [kW]	0.05	0.1	0.2	0.4			
Continuous Ou	utput Current [Arms]	0.66	0.91	2.1	2.8			
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3			
Main Circuit	Power Supply	100 VAC t	o 120 VAC, -15	% to +10%, 50	Hz/60 Hz			
Iviairi Oilcuit	Input Current [Arms]*	1.5	2.5	5	10			
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz						
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38			
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4			
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2			
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12			
	Total Power Loss [W]	17.3	19.8	26.2	38.2			
$ \begin{array}{ccc} \text{Regenerative} & \text{Minimum Allowable External} \\ \text{Resistor} & \text{Resistance } [\Omega] \end{array} $		40	40	40	40			
Overvoltage C	ategory		l	II				

^{*} This is the net value at the rated load.

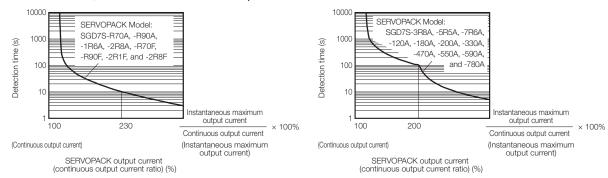
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

	Item			Specification			
Dri	ve Method	IGBT-based PWM control, sine wave current drive					
ack	With Rotary Servomotor	Serial enc	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute enc 22 bits (absolute encoder)				
Feedback	With Linear Servomotor	 Absolute linear encoder (The signal resolution depends on the abs lute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.) 					
	Surrounding Air Temperature*1	With derat	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications. © Derating Specifications (page 353)				
	Storage Temperature	-20°C to 8	35°C				
	Surrounding Air Humidity	95% relati	ve humidity max	x. (with no freezing or condensation)			
	Storage Humidity	95% relati	ve humidity max	x. (with no freezing or condensation)			
	Vibration Resistance	4.9 m/s ²					
SU	Shock Resistance	19.6 m/s ²					
ditio		Class		SERVOPACK Model: SGD7S-			
al Con	Degree of Protection	IP20		1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A,			
Environmental Conditions		IP10		180A, 200A, 330A, 470A, 550A, 590A,			
Enviro	Pollution Degree	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 					
	Altitude*1	1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. Derating Specifications (page 353)					
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity					
Ар	plicable Standards	EN 55011 EN 61800 EN 61800	group 1 class A -3 (Category C2,	CSA C22.2 No.274, EN ISO13849-1: 2015, , EN 61000-6-2, EN 61000-6-4, , Second environment), EN 50178, -1, IEC 61508 series, IEC 62061, 1326-3-1			
		N	lounting	SERVOPACK Model: SGD7S-			
		Base-mo	ounted	All Models			
Mc	punting	Rack-mo	ounted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F			
		Duct-ver	ntilated	470A, 550A, 590A, 780A			
	Speed Control Range	,	t the rated torque cause the Servo	ue, the lower limit of the speed control range			
ce				ax. (for a load fluctuation of 0% to 100%)			
Jan	Coefficient of Speed		•	for a voltage fluctuation of ±10%)			
forn	Fluctuation*2			. (for a temperature fluctuation of 25°C ±25°C)			
Performance	Torque Control Precision (Repeatability)	±1%	,				
	Soft Start Time Setting	0 s to 10 s	s (Can be set se	eparately for acceleration and deceleration.)			
		1		<u> </u>			

Continued on next page.

Continued from previous page.

			Item	Specification	
	Fno	code	er Divided Pulse Output	Phase A, phase B, phase C: Line-driver output	
			n Divided i diec Odiput	Number of divided output pulses: Any setting is allowed.	
	Overheat Protection Input			Number of input points: 1 Input voltage range: 0 V to +5 V	
	als	Input Signals That Can Be Allocated		Allowable voltage range: 24 VDC ±20% Number of input points: 7	
યાક	Sequence Input Signals			Input method: Sink inputs or source inputs Input Signals • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /DEC (Origin Return Deceleration Switch) signal • /EXT1 to /EXT3 (External Latch Input 1 to 3) signals • FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed.	
I/O Signals		Fixed Output		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: Servo Alarm (ALM)	
	Signals			Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3 (A photocoupler output (isolated) is used.)	
	Sequence Output S		tput Signals That Can Allocated	Output Signals • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /BK (Brake) signal • /WARN (Warning) signal • /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.	
	o c	g Interfaces		Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)	
S	RS-422A	(CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port	
Communications	RS-422A	D)	Axis Address Setting	03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.	
mur	ç	2 5	Interface	Personal computer (with SigmaWin+)	
Com	USB	(CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).	
Dis	Displays/Indicators			CHARGE, PWR, CN, L1, and L2 indicators, and one-digit seven-segment display	
MECHATROLINK-III		Со	mmunications Protocol	MECHATROLINK-III	
	Communications		tion Address Settings	03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.	
	Juic	Bai	ud Rate	100 Mbps	
CHAT	omm	Tra	nsmission Cycle	125 μs, 250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms)	
ME	Ŏ	Byt		32 or 48 bytes/station A DIP switch (S3) is used to select the number of transmission bytes.	
ce	О	Per	formance	Position, speed, or torque control with MECHATROLINK-III communications	
Reference	Method	Ret	ference Input	MECHATROLINK-III commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)	
<u> </u>		Pro	ofile	MECHATROLINK-III standard servo profile	

Continued on next page.

Σ-7S Single-axis MECHATROLINK-III Communications Reference SERVOPACKs

Continued from previous page.

	Item	Specification	
MECHATROLINK-III		Rotary switch (S1 and S2) positions: 16	
Communications Setting Switches		Number of DIP switch (S3) pins: 4	
Analog Monitor (CN5)		Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)	
Dynamic Brake (DB)		Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.	
Regenerative Processing		Built-in (An external resistor must be connected to the SGD7S-470A to -780A.) **Built-In Regenerative Resistor* (page 472)	
Overtravel (OT) Prevention		Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal	
Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.	
Utility Functions		Gain adjustment, alarm history, jogging, origin search, etc.	
	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules	
Safety Functions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).	
	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3	
Option Module		Fully-Closed Modules and Safety Modules Note: You cannot use a Fully-Closed Module and a Safety Module together.	

^{*1.} If you combine a Σ -7-Series SERVOPACK with a Σ -V-Series Option Module, the following Σ -V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable range cannot be increased by derating.

Coefficient of speed fluctuation = $\frac{\text{No-load motor speed - Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

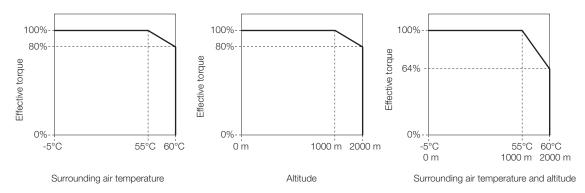
^{*2.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

^{*3.} Always perform risk assessment for the system and confirm that the safety requirements are met.

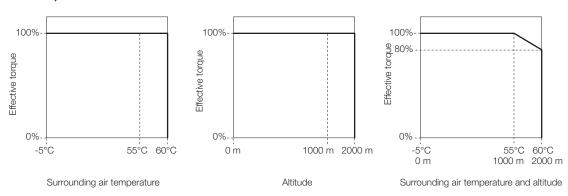
Derating Specifications

If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

◆ SGD7S-R70A, -R90A, -1R6A, -2R8A, -R70F, -R90F, -2R1F, and -2R8F

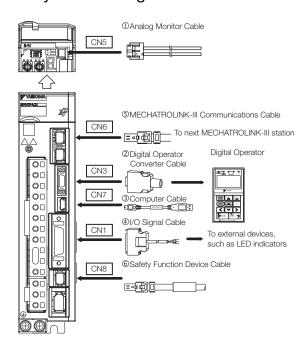


◆ SGD7S-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, -470A, -550A, -590A, and -780A



Selecting Cables

System Configurations



Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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
 - \bigcirc Σ -7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	Length (L)	Order Number	Appearance
1	Analog Monitor Cable	1 m	JZSP-CA01-E	
②	Digital Operator Converter Cable	0.3 m	JZSP-CVS05-A3-E*1	
			JZSP-CVS07-A3-E*2	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

Continued on next page.

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Code	Name		Length (L)	Order Number Appearance		
		Soldered Connector Kit		JZSP-CSI9-2-E		
	I/O Signal Cables	Connector- Terminal Block Con- verter Unit (with cable)	0.5 m	JUSP-TA26P-E		
4			1 m	JUSP-TA26P-1-E		
			2 m	JUSP-TA26P-2-E		
		Cable with Loose Wires	1 m	JZSP-CSI02-1-E	ı	
		at One End (loose wires	2 m	JZSP-CSI02-2-E		
		on peripheral device end)	3 m	JZSP-CSI02-3-E		
			0.2 m	JEPMC-W6012-A2-E		
			0.5 m	JEPMC-W6012-A5-E		
			1 m	JEPMC-W6012-01-E		
	MECHATRO LINK-III Communi- cations Cables	ıni-	2 m	JEPMC-W6012-02-E		
			3 m	JEPMC-W6012-03-E		
			4 m	JEPMC-W6012-04-E	 	
			5 m	JEPMC-W6012-05-E	- <u> [</u>	
			10 m	JEPMC-W6012-10-E		
			20 m	JEPMC-W6012-20-E		
			30 m	JEPMC-W6012-30-E		
(5)			50 m	JEPMC-W6012-50-E		
9			10 m	JEPMC-W6013-10-E		
			20 m	JEPMC-W6013-20-E	三 中	
			30 m	JEPMC-W6013-30-E		
			50 m	JEPMC-W6013-50-E		
			0.5 m	JEPMC-W6014-A5-E		
			1 m	JEPMC-W6014-01-E		
		Cable with	3 m	JEPMC-W6014-03-E	L ,	
		Loose Wires	5 m	JEPMC-W6014-05-E		
		at One End	10 m	JEPMC-W6014-10-E		
			30 m	JEPMC-W6014-30-E		
			50 m	JEPMC-W6014-50-E		
		Cables with	1 m	JZSP-CVH03-01-E	L	
6	Safety Function	Connectors*3	3 m	JZSP-CVH03-03-E	=•何□ 30	
	Device Cables	Connector Kit*4		Contact Tyco Electronic Product name: Industria nector Kit Model number: 201359	al Mini I/O D-shape Type 1 Plug Con-	

^{*1.} This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

^{*2.} If you use a MECHATROLINK-III Communications Reference SERVOPACK, this Converter Cable is required to prevent the cable from disconnecting from the Digital Operator.

^{*3.} When using safety functions, connect this Cable to the safety function devices.

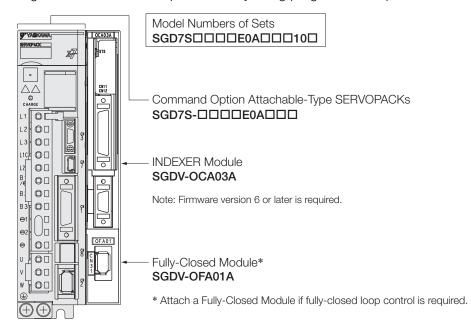
When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

^{*4.} Use the Connector Kit when you make cables yourself.

Σ -7S Single-axis INDEXER Module-Mounted SERVOPACKs

Configuration

A Σ -7S Single-axis INDEXER Module-Mounted SERVOPACK is a Command Option Attachable-Type SERVOPACK with an INDEXER Module mounted on the side of the SERVOPACK. Positioning with single-axis control can be performed by using program table operation and other functions.



Purchase Order Number

Purchasing a Module in a Set with the SERVOPACK

To order SERVOPACKs with a INDEXER Module attached, use the following model numbers.

SGD7S *1

R/0

A

E0

A

000

11th+12th

 Σ -7 Series Σ -7S SERVOPACKs













1st+2nd+3rd digits	Maximum Applicable
Tott Ena Ford digito	Motor Capacity

Voltage	Code	Specification
	R70*2	0.05 kW
	R90*2	0.1 kW
	1R6*2	0.2 kW
	2R8*2	0.4 kW
	3R8	0.5 kW
Three-	5R5*2	0.75 kW
phase,	7R6	1.0 kW
200 VAC	120*3	1.5 kW
VAC	180	2.0 kW
	200*4	3.0 kW
	330	5.0 kW
	470	6.0 kW
	550	7.5 kW
	590	11 kW
	780	15 kW
	R70	0.05 kW
Single- phase,	R90	0.1 kW
100 VAC	2R1	0.2 kW
	2R8	0.4 kW



Code	Specification
Α	200 VAC
F	100 VAC



Code	Specification
E0	Command Option Attachable Type



Olla Olla d'Olla d'atta	Hardware Options
8th+9th+10th digits	Specification

Code	Specification	Applicable Models
None	Without options	All models
	Rack-mounted	SGD7S-R70A to -330A
001	naok moantoa	SGD7S-R70F to -2R8F
	Duct-ventilated	SGD7S-470A to -780A
002	Varnished	All models
008	Single-phase, 200-VAC power supply input	SGD7S-120A
	No dynamia braka	SGD7S-R70A to -2R8A
020*5	No dynamic brake	SGD7S-R70F to -2R8F
	External dynamic brake resistor	SGD7S-3R8A to -780A

11th+12th+13th	digits	Option	Module
(Gi.G.	- Optio:	

Code	Specification
100	INDEXER Module
101	INDEXER Module + Fully-Closed Module

- st 1. The model number of a SERVOPACK with an Option Module is not hyphenated after SGD7S.
- *2. You can use these models with either a single-phase or three-phase power supply input.
- *3. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120AE0A008).
- *4. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *5. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)

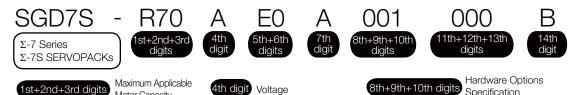
Note: Contact your Yaskawa representative for information on combining options.

Σ-7S Single-axis INDEXER Module-Mounted SERVOPACKs

Purchasing a Module Separately

When ordering SERVOPACKs and Option Modules separately, use the following model numbers.

♦ SERVOPACK



1st+2nd+3rd digits Motor Capacity			
Voltage	Code	Specification	
	R70*1	0.05 kW	
	R90*1	0.1 kW	
	1R6*1	0.2 kW	
	2R8*1	0.4 kW	
	3R8	0.5 kW	
	5R5*1	0.75 kW	
Three-	7R6	1.0 kW	
phase,	120*2	1.5 kW	
200 VAC	180	2.0 kW	
VAC	200*3	3.0 kW	
	330	5.0 kW	
	470	6.0 kW	
	550	7.5 kW	
	590	11 kW	
	780	15 kW	
- ·	R70	0.05 kW	
Single- phase,	R90	0.1 kW	
100 VAC	2R1	0.2 kW	
	2R8	0.4 kW	

	Code	Specification
	Α	200 VAC
	F	100 VAC
5th+6th digits Interface*4		
	Code	Specification
EO Command Opt Attachable Type		Command Option Attachable Type

	7 titadriable Type
7th dig	it Design Revision Order
Α	

	h+9th+10th digits Specification Applicable		
Code	Specification	Models	
None	Without options	All models	
000	This roat options	7 1110 0000	
	Rack-mounted	SGD7S-R70A to -330A	
001	Tidor modified	SGD7S-R70F to -2R8F	
	Duct-ventilated	SGD7S-470A to -780A	
002	Varnished	All models	
008	Single-phase, 200-VAC power supply input	SGD7S-120A	
	No dynamic brake	SGD7S-R70A to -2R8A	
020*5	TNO GYNAITIIC DIAKE	SGD7S-R70F to -2R8F	
	External dynamic brake resistor	SGD7S-3R8A to -780A	

`		
	Code	Specification
	None	None
	000	None

11th+12th+13th digits FT/EX Specification

Code	Specification
None	None
В	BTO Specification

14th digit BTO Specification*6

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120AE0A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive S-7S/S-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.



One Option Case Kit is required for each SERVOPACK. Option Case Kit model: SGDV-OZA01A

INDEXER Module

SGDV-OCA03A

Fully-Closed Module SGDV-OFA01A

Ratings and Specifications

SERVOPACK Ratings

◆ Three-Phase, 200 VAC

Model SGD7S-			R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum Applicable Motor Capacity [kW]			0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0
Continuous (Dutput Curren	t [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous N	/laximum Output	Current [Arms]	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supp	ly		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz									
Circuit	Input Curren	ıt [Arms]*	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supp	ly		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz									
Control	Input Current [Arms]*		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Supply Capacity [kVA]*			0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regenerative Resistor Power Loss [W]		-	-	_	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
Demonstra	Built-In Regenerative	Resistance $[\Omega]$	-	-	_	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	_	_	_	_	40	40	40	60	60	60	180
1 10010101	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	40	40	20	12	12	8
Overvoltage	Category							Ш					

^{*} This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A
Maximum Applicable Motor Capacity [kW]			6.0	7.5	11	15
Continuous Out	put Current [Arms]		46.9	54.7	58.6	78.0
Instantaneous M	1aximum Output C	urrent [Arms]	110	130	140	170
Main Cinavit	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Main Circuit	Input Current [A	rms]*1	29	37	54	73
Control	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Control	Input Current [A	rms]*1	0.3	0.3	0.4	0.4
Power Supply Capacity [kVA]*1			10.7	14.6	21.7	29.6
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4
	Control Circuit F	ower Loss [W]	21	21	28	28
Power Loss*1	External Regene Power Loss [W]	rative Resistor	180*2	350 ^{*3}	350 ^{*3}	350 ^{*3}
	Total Power Los	s [W]	292.7	347.9	393.3	529.4
	External	Resistance $[\Omega]$	6.25*2	3.13*3	3.13*3	3.13*3
Regenerative Resistor	Regenerative Resistor	Capacity [W]	880*2	1760*3	1760*3	1760*3
116313101	Minimum Allowable External Resistance $[\Omega]$		5.8	2.9	2.9	2.9
Overvoltage Cat	egory		III			

^{*1.} This is the net value at the rated load.

^{*2.} This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

^{*3.} This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

♦ Single-phase, 200 VAC

	R70A	R90A	1R6A	2R8A	5R5A	120A		
Maximum Applicable Motor Capacity [kW]			0.05	0.1	0.2	0.4	0.75	1.5
Continuous Ou	utput Current [Ar	ms]	0.66	0.91	1.6	2.8	5.5	11.6
Instantaneous I	Maximum Output	Current [Arms]	2.1	3.2	5.9	9.3	16.9	28
Main Circuit	Power Supply		200	VAC to 240	VAC, -15	% to +10%	%, 50 Hz/6	60 Hz
Main Circuit	Input Current [Arms]*	0.8	1.6	2.4	5.0	8.7	16
Control	Power Supply		200	VAC to 240	VAC, -15	% to +10%	%, 50 Hz/6	0 Hz
Control	Control Input Current [Arms]*		0.2	0.2	0.2	0.2	0.2	0.25
Power Supply Capacity [kVA]*			0.2	0.3	0.6	1.2	1.9	4.0
	Main Circuit Power Loss [W]		5.0	7.1	12.1	23.7	39.2	71.8
	Control Circuit Power Loss [W]		12	12	12	12	14	16
Power Loss*	Built-in Regenerative Resistor Power Loss [W]		_	_	_	_	8	16
	Total Power Lo	ss [W]	17.0	19.1	24.1	35.7	61.2	103.8
	Built-In	Resistance $[\Omega]$	_	-	_	_	40	12
Regenerative Resistor	Regenerative Resistor	Capacity [W]	-	-	-	-	40	60
HESISIUI	Minimum Allowable External Resistance $[\Omega]$		40	40	40	40	40	12
Overvoltage C	ategory		III					

^{*} This is the net value at the rated load.

◆ 270 VDC

Model SGD7S-			R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A
Maximum Appl	cable Motor Capacity [kW]	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5
Continuous Ou	tput Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6
Instantaneous N	Naximum Output Current [Arms]	2.1	3.2	5.9	9.3	11.0	16.9	17.0	28.0
Main Circuit Power Supply			270	O VDC to	o 324 VI	DC, -15	% to +1	0%	
Main Circuit	Input Current [Arms]*1	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11
Control	Power Supply 270 VDC to 324 VDC, -15% to +10%								
Control	Input Current [Arms]*1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2*2
Power Supply (Capacity [kVA]*1	0.2	0.3	0.6	1	1.4	1.6	2.3	3.2
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8
Power Loss*1	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8
Overvoltage Ca	tegory	III							

^{*1.} This is the net value at the rated load.

^{*2}. The value is 0.25 Arms for the SGD7S-120A00A008.

	Model SGD7S-			330A	470A	550A	590A	780A
Maximum Appl	icable Motor Capacity [kW]	2.0	3.0	5.0	6.0	7.5	11.0	15.0
Continuous Ou	tput Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0
Instantaneous N	Maximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170
Main Circuit	Power Supply		270 \	/DC to 32	24 VDC, -	-15% to -	+10%	
Iviaii i Circuit	Input Current [Arms]*	14	20	34	36	48	68	92
Control	Power Supply 270 VDC to 324 VDC, -15% to +10%							
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4
Power Supply (Capacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28
	Total Power Loss [W]	98.7	99.5	165.2	232.6	276.3	271.6	371.4
Overvoltage Ca	ategory				III			

^{*} This is the net value at the rated load.

Single-phase, 100 VAC

	Model SGD7S-	R70F	R90F	2R1F	2R8F		
Maximum App	licable Motor Capacity [kW]	0.05	0.1	0.2	0.4		
Continuous Ou	utput Current [Arms]	0.66	0.91	2.1	2.8		
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3		
Main Circuit	Power Supply	100 VAC t	o 120 VAC, -15	% to +10%, 50	Hz/60 Hz		
Iviaii i Circuit	Input Current [Arms]*	1.5	2.5	5	10		
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz					
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38		
Power Supply	Capacity [kVA]*	0.2	0.3	0.6	1.4		
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2		
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12		
	Total Power Loss [W]	17.3	19.8	26.2	38.2		
$ \begin{array}{ccc} \text{Regenerative} & \text{Minimum Allowable External} \\ \text{Resistor} & \text{Resistance } [\Omega] \end{array} $		40	40	40	40		
Overvoltage C	ategory	III					

^{*} This is the net value at the rated load.

INDEXER Module Power Loss

The power supply for an INDEXER Module is supplied from the control power supply of the SERVO-PACK. The power loss is given in the following table.

Item	Specification
Power Supply Method	5.05 VDC
Maximum Operating Voltage	5.25 VDC
Maximum Operating Current	500 mA
Maximum Power Loss	2.6 W

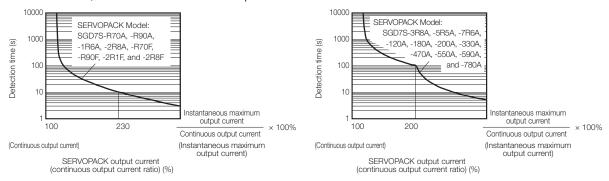
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

The specifications when the INDEXER Module is combined with a Command Option Attachable-Type SERVOPACK are given in the following table.

	Item	Specification					
Со	ntrol Method	IGBT-base	d PWM control	, sine wave current drive			
ack	With Rotary Servomotor		20 bits or 22 bits (a	bsolute encoder) 24 bits (incremental encoder/absolute encoder) bsolute encoder)			
Feedback	With Linear Servomotor	lute linea • Incremer	 Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.) 				
	Surrounding Air Temperature	0°C to 55°	С				
	Storage Temperature	-20°C to 8	5°C				
	Surrounding Air Humidity	90% relativ	e humidity ma	x. (with no freezing or condensation)			
	Storage Humidity	90% relativ	e humidity ma	x. (with no freezing or condensation)			
	Vibration Resistance	4.9 m/s ²					
NS	Shock Resistance	19.6 m/s ²					
nditio		Class		SERVOPACK Model: SGD7S-			
al Cor	Degree of Protection	IP20	R70A, R90A, R70F, R90F,	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 2R1F, 2R8F			
Environmental Conditions		IP10	1204F04008 1804 2004 3304 4704 5504 5904				
Enviro	Pollution Degree	• Must be	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 				
	Altitude	1,000 m m		or non dust.			
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity					
Ар	plicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1					
		Mc	ounting	SERVOPACK Model: SGD7S-			
		Base-moi	unted	All Models			
Mo	punting	Rack-mor	unted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F			
		Duct-vent	tilated	470A, 550A, 590A, 780A			
	Speed Control Range	,		ue, the lower limit of the speed control range omotor to stop.)			
Performance	Coefficient of Speed Fluctuation*1	0% of rate	d speed max. (hax. (for a load fluctuation of 0% to 100%) for a voltage fluctuation of ±10%) x. (for a temperature fluctuation of 25°C ±25°C)			
Perf	Torque Control Precision (Repeatability)	±1%		(1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
	Soft Start Time Setting	0 s to 10 s	(Can be set se	eparately for acceleration and deceleration.)			
gnals	Encoder Divided Pulse Output		phase B, phase ses: Any settin	C: Line-driver output Number of divided g is allowed.			
I/O Signals	Overheat Protection Input		Number of input points: 1 Input voltage range: 0 V to +5 V				
				Continued on next nage			

	Continued from previous pag Item Specification									
			item	·						
				Allowable voltage range: 24 VDC ±20% Number of input points: 6						
		SERVOPACK	ような	Input method: Sink inputs or source inputs Input Signals: • Alarm Reset (/ALM-RST) • Forward Drive Prohibited (P-OT) • Reverse Drive Prohibited (N-OT) • Origin Return Deceleration Switch (/DEC) • Registration (/RGRT) • Servo ON (/S-ON) A signal can be allocated and the positive and negative logic can be changed.						
	S			Allowable voltage range: 24 VDC ±20% Number of input points: 11						
	Signals			/MODE 0/1 (Mode Switch Input) signal						
	t Sić			Mode 0 Mode 1						
I/O Signals	Sequence Input INDEXER Module		Fixed Input	 /START-STOP (Program Table Operation Start-Stop Input) signal /PGMRES (Program Table Operation Reset Input) signal /SEL0 (Program Step Selection Input 0) signal /SEL1 (Program Step Selection Input 1) signal /SEL2 (Program Step Selection Input 2) signal /SEL3 (Program Step Selection Input 3) signal /SEL4 (Program Step Selection Input 4) signal /SEL5 (Program Step Selection Input 3) signal /SEL5 (Program Step Selection Input 5) signal /SEL6 (Program Step Selection Input 6) signal /SEL7 (Program Step Selection Input 7) signal 						
			Fixed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: Servo Alarm (/ALM)						
)PACK		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3 (A photocoupler output (isolated) is used.)						
	Output Signals	SERVOPACK	Output Signals for Which Allocations Can Be Changed	Output Signals: • Warning Output (/WARN) • Brake Output (/BK) • Servo Ready Output (/S-RDY) • Alarm Code Output (/ALO1, /ALO2, and /ALO3) A signal can be allocated and the positive and negative logic can be changed.						
	Sednence O	INDEXER Module	Fixed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 9 Output Signals: Positioning Completion Output (/INPOSITION) Programmable Output 0 (/POUT0) Programmable Output 1 (/POUT1) Programmable Output 2 (/POUT2) Programmable Output 3 (/POUT3) Programmable Output 4 (/POUT4) Programmable Output 5 (/POUT5) Programmable Output 6 (/POUT6) Programmable Output 7 (/POUT7)						

	Continued from previous page.						
		Item	Specification				
	RS-422A Communications	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)				
ons	RS-422A	1:N Communications	Up to N = 15 stations possible for RS-422A port				
nicati	Comir	Axis Address Setting	Set with parameters.				
JI L	suc	Interfaces	Interface Personal computer (with SigmaWin+)				
Communications	USB Communications	Communications Standard	Conforms to USB2.0 standard (12 Mbps).				
- (0	SERVOPACK CHARGE and PWR indicators, and one-digit seven-segment disp						
Displays/ Indicators	INDE	(ER Module	Refer to the following manual for details. Ω Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual (Manual No.: SIEP S800001 64)				
spc		am Table Method	 Program table positioning in which steps are executed sequentially by commands given through contact input or serial communications Positioning in which station numbers are specified by commands given through contact input or serial communications 				
eth		lax. Number of Steps	256				
Ž	-	lax. Number of Tables	256				
ıţi	N	lax. Number of Stations	256				
Operating Methods	Serial Metho	Communications od	Serial command by 1-channel ASCII code Communications specifications: RS-422/485 (50 m max.) Connection topology: Multi-drop connection (16 axes max.) Baud rate: 9600, 19200, 38400 bps				
	Other	Functions	Registration (positioning by external signals), origin return				
Ana	alog Mo	onitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)				
Dyr	namic E	Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.				
Reç	generat	ive Processing	Built-in (An external resistor must be connected to the SGD7S-470A to -780A.) Refer to the following section for details. **Built-In Regenerative Resistor* (page 472)*				
Ove	Overtravel (OT) Prevention		Stopping with a dynamic brake (DB), coasting to a stop, performing a hard stop, or performing a smooth stop (decelerating to a stop) for a CCW-OT (CCW Drive Prohibit Input) signal or CW-OT (CW Drive Prohibit Input) signal.				
	Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.				
	ity Fun	ctions	Gain adjustment, alarm history, jogging, origin search, etc.				
>	Su Ir	puts	/HWBB1 and /HWBB2: Base block signals for Power Modules				
Safety	O di	utput	EDM1: Monitors the status of built-in safety circuit (fixed output).				
_ ()	∄ A	pplicable Standards*2	ISO13849-1 PLe (Category 3), IEC61508 SIL3				
App	olicable	Option Modules	Fully-Closed Module Note: You cannot use a Safety Module if you are using an INDEXER Module.				

^{*1}. The coefficient of speed fluctuation for load fluctuation is defined as follows:

 $\label{eq:coefficient} \mbox{Coefficient of speed fluctuation} = \frac{\mbox{No-load motor speed - Total-load motor speed}}{\mbox{Rated motor speed}} \times 100\%$

^{*2.} Always perform risk assessment for the system and confirm that the safety requirements are met.

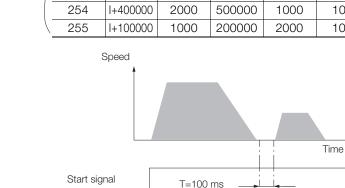
Reference Methods

The INDEXER Module has two reference methods: digital I/O and serial commands. These command methods are described in the following sections.

Digital I/O is used with a program table (mode 0) or a jog speed table (mode 1). You can use a program table (mode 0) to execute the program steps that you select with I/O signal patterns (binary format). If the jog speed table (mode 1) is being used, the jog speed selected with the input signal pattern (binary format) can be executed.

· Program Table

PGMSTEP POS SPD RDST **RSPD** ACC* DEC* **EVENT** LOOP NEXT I+400000 2000 500000 1000 200 100 T5000 0 1 1 I+100000 1000 200000 2000 100 50 IT0 END 1 1 256 I+400000 2000 500000 1000 100 50 IT100 1 n+1 n steps n+1 I+100000 1000 200000 2000 NT0 1 **END** : ÷ : : : 254 I+400000 2000 500000 1000 100 50 SEL3T200 1 127 255 I+100000 1000 200000 2000 100 50 DT0 1 **END**

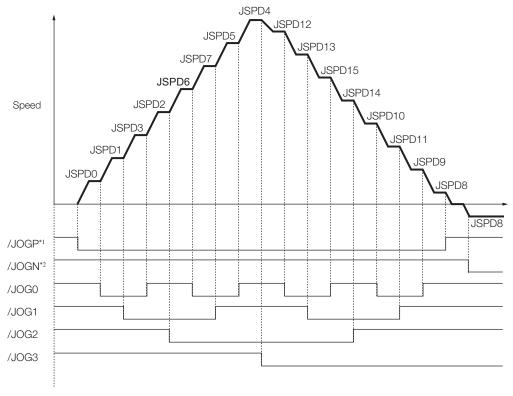


Positioning Completion signal

• Jog Speed Table

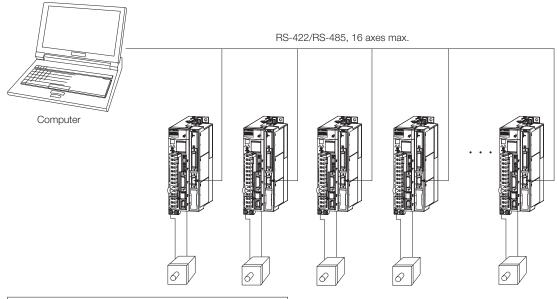
	JSPD	JOG3	JOG2	JOG1	JOG0	Jog Speed
	0	0	0	0	0	1000
	1	0	0	0	1	2000
	2	0	0	1	0	4000
16 combi-	:	:	:	:	:	:
combi- nations	÷	:	:	:	::	:
	:	:	:	:		:
	15	1	1	1	1	5500

Note: 1: Signal is ON (active), 0: Signal is OFF (inactive).



- *1. Forward operation at the jog speed is performed while the /JOGP signal is ON.
- *2. Reverse operation at the jog speed is performed while the /JOGN signal is ON.

With serial commands, ASCII command strings are sent to the INDEXER Module through RS-422 or RS-485 communications and these commands are interpreted and executed immediately. You can use general-purpose serial communications (RS422/RS485) to perform independent control of up to 16 axes from one host controller (e.g., PC or HMI).



1SVON # Servo turned ON.

1POSI=400000 # Set relative position to 400,000.

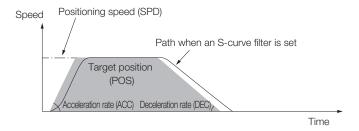
1SPD=2000 # Set speed to 2,000.

1ACC=200 # Set acceleration rate to 200.

1DEC=100 # Set deceleration rate to 100.

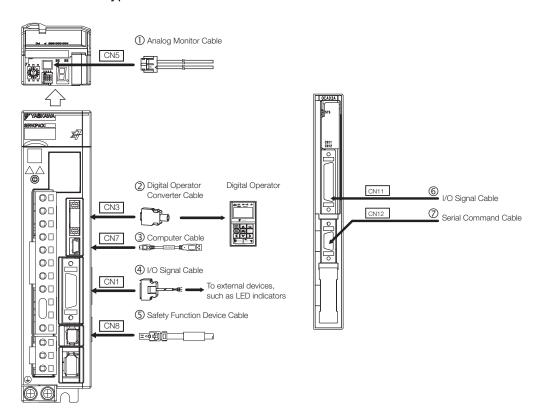
1ST # Start operation.

:



Selecting Cables

- System Configurations
- Σ-7S Single-axis Command Option Attachable-Type SERVOPACKs
- Command Option Module: INDEXER Module



Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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
- Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	Length (L)	Order Number	Appearance
①	Analog Monitor Cable	1 m	JZSP-CA01-E	
2	Digital Operator Converter Cable	0.3 m	JZSP-CVS05-A3-E*1	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

Code	N	ame	Length (L)	Order Number	Appearance	
		Soldered Conn	ector Kit	JZSP-CSI9-2-E		
		Connector-	0.5 m	JUSP-TA26P-E		
		Terminal Block Con-	1 m	JUSP-TA26P-1-E		
4	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA26P-2-E		
		Cable with Loose Wires	1 m	JZSP-CSI02-1-E		
		at One End (loose wires	2 m	JZSP-CSI02-2-E		
		on peripheral device end)		JZSP-CSI02-3-E	4	
	Safety Function Device Cables	Cables with	1 m	JZSP-CVH03-01-E	, L ,	
		Connectors*2	3 m	JZSP-CVH03-03-E	■●	
⑤		Connector Kit*3		Contact Tyco Electronics Japan G.K. Product name: Industrial Mini I/O D-shape Type 1 Plug Connector Kit Model number: 2013595-1		
		Connector Kit		DP9420007-E		
		Cables with	1 m	JZSP-CVI01-1-E		
	I/O Signal	Loose Wires	2 m	JZSP-CVI01-2-E		
6	Cables	at One End	3 m	JZSP-CVI01-3-E	<u> </u>	
		Cables with	0.5 m	JUSP-TA36V-E		
		Terminal Block on One	1 m	JUSP-TA36V-1-E		
		End	2 m	JUSP-TA36V-2-E		
7	Serial Com- mand Cable	Connector Kit*3		JZSP-CHI9-1	Contact Yaskawa Controls Co., Ltd. for the cable.	

^{*1.} This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

^{*2.} When using safety functions, connect this Cable to the safety function devices.

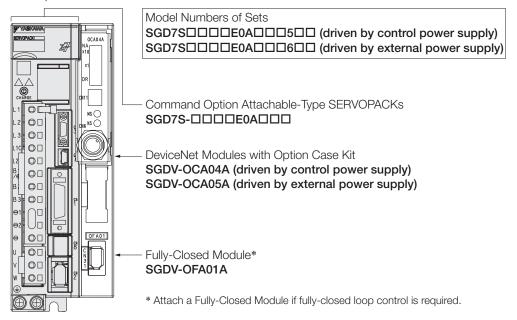
When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-

^{*3.} Use the Connector Kit when you make cables yourself.

Σ-7S Single-axis DeviceNet Module-Mounted SERVOPACKs

Configuration

A Σ -7S Single-axis DeviceNet Module-Mounted SERVOPACK is a Command Option Attachable-Type SERVOPACK with a DeviceNet Module mounted on the side of the SERVOPACK. Positioning and origin returns can be performed by sending commands from the host controller (DeviceNet master).



Purchase Order Number

Purchasing a Module in a Set with the SERVOPACK

To order SERVOPACKs with a DeviceNet Module attached, use the following model numbers.

SGD7S *1

 Σ -7 Series Σ -7S SERVOPACKs

H/U1st+2nd+3rd













1st+2nd+3rd digits Ma

Maximum Applicable Motor Capacity

		Ινιστοί σαρ				
Voltage	Code	Specification				
	R70*2	0.05 kW				
	R90*2	0.1 kW				
	1R6*2	0.2 kW				
	2R8*2	0.4 kW				
	3R8	0.5 kW				
Three-	5R5*2	0.75 kW				
phase,	7R6	1.0 kW				
200 VAC	120*3	1.5 kW				
VAC	180	2.0 kW				
	200*4	3.0 kW				
	330	5.0 kW				
	470	6.0 kW				
	550	7.5 kW				
	590	11 kW				
	780	15 kW				
Single-	R70	0.05 kW				
phase,	R90	0.1 kW				
100	2R1	0.2 kW				
VAC	2R8	0.4 kW				



Code	Specification
Α	200 VAC
F	100 VAC

5th+6th digits Interface

Code	Specification
E0	Command Option Attachable Type



	Hardware Options
8th+9th+10th digits	Specification

Code	Specification	Applicable Models		
None	Without options	All models		
	Rack-mounted	SGD7S-R70A to -330A		
001	Tidok modifica	SGD7S-R70F to -2R8F		
	Duct-ventilated	SGD7S-470A to -780A		
002	Varnished	All models		
800	Single-phase, 200-VAC power supply input	SGD7S-120A		
	No dynamic brake	SGD7S-R70A to -2R8A		
020*5	TNO GYTTATTIIC DIANE	SGD7S-R70F to -2R8F		
	External dynamic brake resistor	SGD7S-3R8A to -780A		

11th+12th+13th digits	Option Module

Code	Specification
500	DeviceNet Module driven by control power supply
501	DeviceNet Module driven by control power supply +Fully-Closed Module
600	DeviceNet Module driven by external power supply
601	DeviceNet Module driven by external power supply +Fully-Closed Module

- *1. The model number of a SERVOPACK with an Option Module is not hyphenated after SGD7S.
- *2. You can use these models with either a single-phase or three-phase power supply input.
- *3. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120AE0A008).
- *4. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *5. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)

Note: Contact your Yaskawa representative for information on combining options.

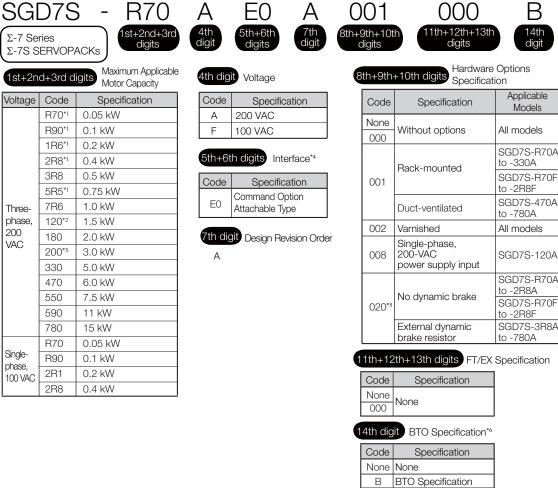
The DeviceNet Module is equipped with an Option Case Kit. (Option Case Kits do not need to be ordered separately.)

Σ-7S Single-axis DeviceNet Module-Mounted SERVOPACKs

Purchasing a Module Separately

When ordering SERVOPACKs and Option Modules separately, use the following model numbers.

◆ SERVOPACK



- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120AE0A008).
- *3. The rated output is 2.4 kW if you combine the SGM7G-30A with the SGD7S-200A.
- *4. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *5. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

DeviceNet Modules

SGDV-OCA04A (driven by control power supply)
SGDV-OCA05A (driven by external power supply)



The DeviceNet Module is equipped with an Option Case Kit. (Option Case Kits do not need to be ordered separately.)

◆ Fully-Closed Module

SGDV-OFA01A

Ratings and Specifications

SERVOPACK Ratings

◆ Three-Phase, 200 VAC

Model SGD7S-			R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A
Maximum Applicable Motor Capacity [kW]			0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0
Continuous C	Output Curren	t [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9
Instantaneous M	laximum Output	Current [Arms]	2.1	3.2	5.9	9.3	11	16.9	17	28	42	56	84.0
Main	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	-
Circuit	Input Curren	t [Arms]*	0.4	0.8	1.3	2.5	3.0	4.1	5.7	7.3	10	15	25
Control	Power Supp	ly		200	VAC	to 240	VAC,	-15%	to +10	%, 50	Hz/60	Hz	·
Control	Input Curren	t [Arms]*	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.25	0.25	0.3
Power Suppl	y Capacity [k\	/A]*	0.2	0.3	0.5	1.0	1.3	1.6	2.3	3.2	4.0	5.9	7.5
	Main Circuit Power Loss [W]		5.0	7.0	11.9	22.5	28.5	38.9	49.2	72.6	104.2	114.2	226.6
Power	Control Circuit Power Loss [W]		12	12	12	12	14	14	14	15	16	16	19
Loss*	Built-in Regenerative Resistor Power Loss [W]		-	_	_	_	8	8	8	10	16	16	36
	Total Power	Loss [W]	17.0	19.0	23.9	34.5	50.5	60.9	71.2	97.6	136.2	146.2	281.6
	Built-In Regenerative	Resistance $[\Omega]$	-	_	_	_	40	40	40	20	12	12	8
Regenerative Resistor	Resistor	Capacity [W]	_	_	_	-	40	40	40	60	60	60	180
1 16313101	Minimum Allowable External Resistance [Ω]		40	40	40	40	40	40	40	20	12	12	8
Overvoltage (Category							III					

^{*} This is the net value at the rated load.

	Model SGD7S-		470A	550A	590A	780A		
Maximum Applic	cable Motor Capac	city [kW]	6.0	7.5	11	15		
Continuous Out	put Current [Arms]		46.9	54.7	58.6	78.0		
Instantaneous M	1aximum Output C	urrent [Arms]	110	130	140	170		
Main Circuit	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz		
Main Circuit	Input Current [A	rms]*1	29	37	54	73		
Control	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz		
Control	Input Current [A	rms]*1	0.3	0.3	0.4	0.4		
Power Supply C	apacity [kVA]*1		10.7	14.6	21.7 29.6			
	Main Circuit Pov	ver Loss [W]	271.7	326.9	365.3	501.4		
Continuous Out Instantaneous M Main Circuit Control Power Supply C Power Loss*1 Regenerative Resistor	Control Circuit F	ower Loss [W]	21	21	28	28		
Power Loss*1	External Regene Power Loss [W]	rative Resistor	6.0 7.5 11 15 46.9 54.7 58.6 78.0 s] 110 130 140 170 200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 H 29 37 54 73 200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 H 0.3 0.3 0.4 0.4 10.7 14.6 21.7 29.6 271.7 326.9 365.3 501.4 W] 21 21 28 28 tor 180*2 350*3 350*3 350* 292.7 347.9 393.3 529.4 s [Ω] 6.25*2 3.13*3 3.13*3 3.13*3 M] 880*2 1760*3 1760*3 1760*	350 ^{*3}				
	Total Power Los	s [W]	292.7	347.9	11 15 58.6 78.0 140 170 % to +10%, 50 Hz/60 Hz 54 73 % to +10%, 50 Hz/60 Hz 0.4 0.4 21.7 29.6 365.3 501.4 28 28 350*3 350*3 393.3 529.4 3.13*3 3.13*3 1760*3 1760*3 2.9 2.9			
	External	Resistance $[\Omega]$	6.25*2	3.13*3	3.13*3	3.13*3		
	Regenerative Resistor	Capacity [W]	880*2	1760*3	1760*3	1760*3		
116313101	Minimum Allowa Resistance $[\Omega]$	ble External	5.8	46.9 54.7 58.6 78.0 110 130 140 170 00 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz 29 37 54 73 00 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz 0.3 0.3 0.4 0.4 10.7 14.6 21.7 29.6 271.7 326.9 365.3 501.4 21 21 28 28 180*2 350*3 350*3 350*3 292.7 347.9 393.3 529.4 6.25*2 3.13*3 3.13*3 3.13*3 3.80*2 1760*3 1760*3 1760*3 5.8 2.9 2.9 2.9	2.9			
Overvoltage Cat	egory			I	II			

^{*1.} This is the net value at the rated load.

^{*2.} This value is for the optional JUSP-RA04-E Regenerative Resistor Unit.

^{*3.} This value is for the optional JUSP-RA05-E Regenerative Resistor Unit.

♦ Single-phase, 200 VAC

	Model SGD7S-		R70A	R90A	1R6A	2R8A	5R5A	120A
Maximum App	licable Motor Ca	pacity [kW]	0.05	0.1	0.2	0.4	0.75	1.5
Continuous Ou	utput Current [Ar	ms]						11.6
Instantaneous I	Maximum Output	ximum Output Current [Arms] 2.1 3.2 5.9					16.9	28
	Power Supply		200	VAC to 24	0 VAC, -15	% to +109	%, 50 Hz/6	0 Hz
Main Circuit	Input Current [A	Arms]*	0.8	1.6	2.4	5.0	0.4 0.75 2.8 5.5 9.3 16.9 to +10%, 50 Hz/60 H 5.0 8.7 to +10%, 50 Hz/60 H 0.2 0.2 1.2 1.9 23.7 39.2 12 14 - 8	16
Power Supply			Arms] 2.1 3.2 5.9 9.3 16.9 28 200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz 0.8 1.6 2.4 5.0 8.7 16 200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz 0.2 0.2 0.2 0.2 0.2 0.25 0.2 0.3 0.6 1.2 1.9 4.0 [W] 5.0 7.1 12.1 23.7 39.2 71.8 s [W] 12 12 12 14 16 - - - 8 16 17.0 19.1 24.1 35.7 61.2 103.8					
Control	Input Current [A	Arms]*	0.2	0.1 0.2 0.4 0.75 1.5 0.91 1.6 2.8 5.5 11.6 3.2 5.9 9.3 16.9 28 00 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz 1.6 2.4 5.0 8.7 16 00 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz 0.2 0.2 0.2 0.25 0.3 0.6 1.2 1.9 4.0 7.1 12.1 23.7 39.2 71.8 12 12 12 14 16 - - 8 16 19.1 24.1 35.7 61.2 103.8 - - 40 12 - - 40 60 40 40 40 40 12	0.25			
Power Supply	Capacity [kVA]*		0.2 0.3 0.6 1.2 1.9 4.0					4.0
	Main Circuit Po	5.0	7.1	12.1	23.7	39.2	71.8	
	Control Circuit I	12	12	12	12	14	16	
Continuous Output Current [Arms] 0.66 0.91 1.6 2.8 Instantaneous Maximum Output Current [Arms] 2.1 3.2 5.9 9.3 Main Circuit Power Supply 200 VAC to 240 VAC, -15% to +10 Input Current [Arms]* 0.8 1.6 2.4 5.0 Power Supply 200 VAC to 240 VAC, -15% to +10 Input Current [Arms]* 0.2 0.2 0.2 0.2 Power Supply Capacity [kVA]* 0.2 0.3 0.6 1.2 Main Circuit Power Loss [W] 5.0 7.1 12.1 23.7 Control Circuit Power Loss [W] 12 12 12 12 Power Loss* Built-in Regenerative Resistor Power Loss [W] - - - - - - Regenerative Resistor Resistance [Ω] - - - - - - Minimum Allowable External Minimum Allowable External - - - - - -	_	8	16					
	Total Power Lo	ss [W]	17.0	19.1	24.1	35.7	61.2	103.8
	Built-In	Resistance $[\Omega]$	-	-	-	-	40	12
· ·	Input Current [Arms]* 0.8 1.6 2.4 5.0 8.7	40	60					
UESISTOI		12						
Overvoltage Ca	ategory			•	ı	I	•	-

^{*} This is the net value at the rated load.

♦ 270 VDC

	Model SGD7S-	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A		
Maximum Applicable Motor Capacity [kW]		0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5		
Continuous Ou	tput Current [Arms]	0.66	0.91						11.6		
Instantaneous N	Maximum Output Current [Arms]	2.1	3.2	5.9	9.3	11.0					
Main Circuit	Power Supply		270) VDC to	324 VI	DC, -15	% to +1	0.75 1.0 5.5 7.6 16.9 17.0 10.9 17.0 10.9 10.0 10.9 10.0 10.9 10.0 10.0 10.0 10.			
Mairi Gircuit	Input Current [Arms]*1	0.5	1.0	1.5	3.0	3.8	4.9	6.9	11		
Control	Power Supply		270 VDC to 324 VDC, -15% to +10%				0.75				
Control	Input Current [Arms]*1	0.2	0.2	0.2	0.2	0.2	0.2	1.0 7.6 17.0 17.0 -10% 6.9 -10% 0.2 2.3 38.7 14	0.2*2		
Power Supply (Capacity [kVA]*1	0.2	0.3	0.6	1	1.4	1.6	0.2 0.2 2.3 3.2			
	Main Circuit Power Loss [W]	4.4	5.9	9.8	17.5	23.0	30.7	38.7	55.8		
Power Loss*1	Control Circuit Power Loss [W]	12	12	12	12	14	14	14	15		
	Total Power Loss [W]	16.4	17.9	21.8	29.5	37.0	44.7	52.7	70.8		
Overvoltage Ca	itegory				I	II					

^{*1.} This is the net value at the rated load.

^{*2}. The value is 0.25 Arms for the SGD7S-120A00A008.

Model SGD7S-		180A	200A	330A	470A	550A	590A	780A
Maximum Appl	icable Motor Capacity [kW]	2.0	3.0	5.0	6.0	7.5	11.0	15.0
Continuous Ou	tput Current [Arms]	18.5	19.6	32.9	46.9	54.7	58.6	78.0
Instantaneous N	Maximum Output Current [Arms]	42.0	56.0	84.0	110	130	140	170
Main Circuit	Power Supply		270 \	/DC to 32	24 VDC,	-15% to -	+10%	
Iviaii i Circuit	Input Current [Arms]*	14	20	34	36	48	68	92
Control Power Supply		270 VDC to 324 VDC, -15% to +10%						
Control	Input Current [Arms]*	0.25	0.25	0.3	0.3	0.3	0.4	0.4
Power Supply (Capacity [kVA]*	4.0	5.9	7.5	10.7	14.6	21.7	29.6
	Main Circuit Power Loss [W]	82.7	83.5	146.2	211.6	255.3	243.6	343.4
Power Loss*	Control Circuit Power Loss [W]	16	16	19	21	21	28	28
Total Power Loss [W]		98.7	99.5	165.2	232.6	276.3	271.6	371.4
Overvoltage Category					III			

^{*} This is the net value at the rated load.

◆ Single-phase, 100 VAC

Model SGD7S-		R70F	R90F	2R1F	2R8F
Maximum App	licable Motor Capacity [kW]	0.05	0.1	0.2	0.4
Continuous Ou	utput Current [Arms]	0.66	0.91	2.1	2.8
Instantaneous	Maximum Output Current [Arms]	2.1	3.2	6.5	9.3
Main Circuit	Power Supply	100 VAC t	o 120 VAC, -15	% to +10%, 50	Hz/60 Hz
Iviaii i Oil Cuit	Input Current [Arms]*	1.5	2.5	5	10
Power Supply		100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz			
Control	Input Current [Arms]*	0.38	0.38	0.38	0.38
Power Supply Capacity [kVA]*		0.2	0.3	0.6	1.4
	Main Circuit Power Loss [W]	5.3	7.8	14.2	26.2
Power Loss*	Control Circuit Power Loss [W]	12	12	12	12
	Total Power Loss [W]	17.3	19.8	26.2	38.2
Regenerative Resistor	Minimum Allowable External Resistance [Ω]	40	40	40	40
Overvoltage Category			II	I	

^{*} This is the net value at the rated load.

DeviceNet Module Ratings

The power supply method and power loss of a DeviceNet Module depend on the model of the DeviceNet Module.

◆ SGDV-OCA04A (Interface: Driven by Control Power Supply)

The specifications of the SGDV-OCA04A DeviceNet Module are given in the following table.

Item	Specification				
iteiii	DeviceNet Communications Section	Control Section			
Power Supply Method	Supplied from the DeviceNet communications cable.	Supplied from the control power supply of a Command Option Attachable-Type SERVOPACK.			
Minimum Operating Voltage	11 VDC				
Maximum Operating Voltage	25 VDC	Included in the current consumption of the Command Option Attachable-Type			
Maximum Operating Current	25 mA	SERVOPACK.			
Maximum Power Loss	625 mW				

◆ SGDV-OCA05A (Interface: Driven by External Power Supply)

The specifications of the SGDV-OCA05A DeviceNet Module are given in the following table.

Item	Specification				
item	DeviceNet Communications Section	Control Section			
Power Supply Method	Supplied from the DeviceNet communications cable.				
Minimum Operating Voltage	11 VDC				
Maximum Operating Voltage	25 VDC				
Maximum Operating	100 mA for 24-VDC power supply				
Current	200 mA for 11-VDC power supply				
Maximum Power Loss	2.4 W				

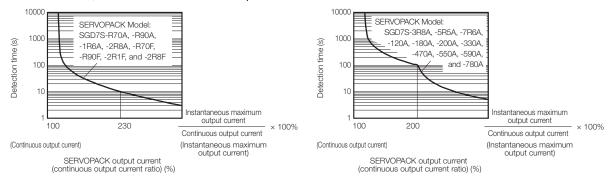
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

The specifications when the DeviceNet Module is combined with a Command Option Attachable-Type SERVOPACK are given in the following table.

Item		Specification					
Coi	Control Method		IGBT-based PWM control, sine wave current drive				
ack	With Rotary Servomotor		20 bits or 2 22 bits (ab	osolute encoder) 24 bits (incremental encoder/absolute encoder) osolute encoder)			
Feedback	With Linear Servomotor	 Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.) 					
	Surrounding Air Temperature	0°C to 55°	°C				
	Storage Temperature	-20°C to 85°C					
	Surrounding Air Humidity	90% relativ	e humidity max	. (with no freezing or condensation)			
	Storage Humidity	90% relativ	e humidity max	. (with no freezing or condensation)			
	Vibration Resistance	4.9 m/s ²					
NS	Shock Resistance	19.6 m/s ²					
ditio		Class		SERVOPACK Model: SGD7S-			
Environmental Conditions	Degree of Protection	IP20	R70A, R90A, R70F, R90F, 2	1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, R1F, 2R8F			
nment		IP10	120AE0A008, 780A	180A, 200A, 330A, 470A, 550A, 590A,			
Pollution Degree Pollution Degree Pollution Degree Pollution Degree Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust.			water, oil, or chemicals.				
	Altitude	1,000 m max.					
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity					
Арі	Applicable Standards		UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1				
		M	lounting	SERVOPACK Model: SGD7S-			
		Base-mo		All Models			
Мо	unting	Rack-mo	ounted	R70A, R90A, 1R6A, 2R8A, 3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A, R70F, R90F, 2R1F, 2R8F			
		Duct-ver	ntilated	470A, 550A, 590A, 780A			
	Speed Control Range		the rated torqualse the Servo	e, the lower limit of the speed control range motor to stop.)			
Ce				ax. (for a load fluctuation of 0% to 100%)			
nan	Coefficient of Speed	0% of rated speed max. (for a voltage fluctuation of ±10%)					
forr	Fluctuation*1	±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)					
Coefficient of Speed Fluctuation*1 Coefficient of Speed Fluctuation*1 Downward of rated speed max. (for a load fluctuation of 0% to 10 0% of rated speed max. (for a voltage fluctuation of ±10%) ±0.1% of rated speed max. (for a temperature fluctuation of 25% of rated speed max.) Example 10 Downward							
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)					
Signals	Encoder Divided Pulse Output			C: Line-driver output pulses: Any setting is allowed.			
Overheat Protection Input Number of input points: 1 Input voltage range: 0 V to +5 V) +5 V			

			Continued from previous page.
		Item	Specification
	t		Allowable voltage range: 24 VDC ±20% Number of input points: 4
/O Signals	Sequence Input Signals	Fixed Input	Input method: Sink inputs or source inputs Input Signals • CCW-OT (CCW Drive Prohibit Input) signal • CW-OT (CW Drive Prohibit Input) signal • /HOME (Origin Signal Input) signal • EXSTOP (External Stop Input) Signal Positive or negative logic can be changed in the parameters.
0/1	utput		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 4
	Sequence Output Signals	Fixed Output	Output Signals • ALM (Servo Alarm Output) signal • /WARN (Warning Signal Output) signal • /BK (Brake) signal • /S-RDY (Servo Ready Output) signal
Communications	Digital Operator Communications (CN3)	Interfaces	Digital Operator (JUSP-OP05A-1-E)
ımun	ations (Interface	Personal computer (with SigmaWin+)
Corr	USB Communications (CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).
/ S	SERVO	PACK	CHARGE and PWR indicators, and one-digit seven-segment display
Displays Indicator	DeviceNet Module		Refer to the following manual for details. Ω Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with DeviceNet Module Product Manual (Manual No.: SIEP S800001 70)
-	o p	Operation Specifications	Positioning via DeviceNet communications.
	Reference Method	Reference Inputs	DeviceNet communications Commands: Movement references (positioning or speed) and origin returns
	tion trol tions	Acceleration/Deceleration Methods	Linear, asymmetrical, exponential, and S-curve acceleration/deceleration
thods	Position Control Functions	Operating Methods Fully-Closed Loop Control	Simple positioning, origin returns, continuous operation, and switching to positioning Supported.
Operating Methods	Built-in Functions	Position Data Latching	Position data can be latched on phase C, the origin signal, or an external signal.
)perat	เทธ	Communications Methods	DeviceNet I/O communications and explicit messages
0	Net atic	Topology	Multidrop or T-branching*2
	DeviceNet Communications	Baud Rate	125 kbps, 250 kbps, or 500 kbps (Set on rotary switch (DR).)
	Dev	Cables	Special cables (OMRON DCA1-5CN02F1 Cable with Connectors or the equivalent.)
	Cor	Maximum Number of Nodes	64 nodes (including the master, Maximum number of slaves: 63)
	_	Node Address Setting	0 to 63 (Set on NA x10 and x1 rotary switches.)
Ana	Analog Monitor (CN5)		Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)
Dyr	namic Bra	ake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.
Reg	Regenerative Processing		Built-in (An external resistor must be connected to the SGD7S-470A to -780A.) Refer to the following section for details. Built-In Regenerative Resistor (page 472)

Item		Specification
Overtravel (OT) Prevention		Stopping with a dynamic brake (DB), coasting to a stop, performing a hard stop, or smooth stop (decelerating to a stop) for a CCW-OT (CCW Drive Prohibit Input) signal or CW-OT (CW Drive Prohibit Input) signal.
Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.
Utility F	unctions	Gain adjustment, alarm history, jogging, origin search, etc.
y	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules
Safety Functions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).
Applicable Standards*3		ISO13849-1 PLe (Category 3), IEC61508 SIL3
Applicable Option Modules		Fully-Closed Module Note: You cannot use a Safety Module if you are using a DeviceNet Module.

^{*1.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = No-load motor speed - Total-load motor speed × 100% Rated motor speed

The following table gives the specifications of the DeviceNet Module.

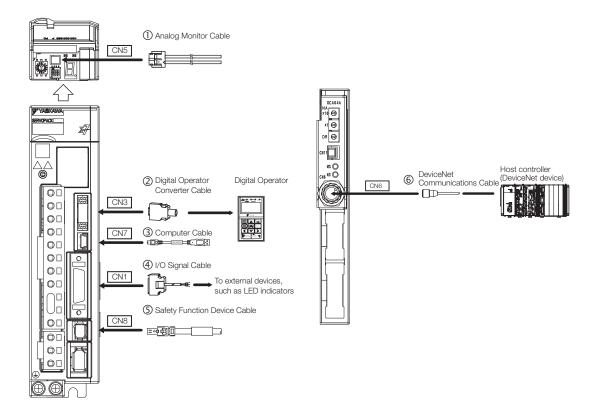
Item		Specification			
	Item	SGDV-OCA04A	SGDV-OCA05A		
Mounting Location		Mounted to the side of a Command Option Attachable-Type SER-VOPACK.			
Power Supply Method	Control Section	Supplied from the control power supply of a Command Option Attachable-Type SERVOPACK.	Supplied from the DeviceNet communications cable.		
Wethod	DeviceNet Communications Section	Supplied from the DeviceNet communications cable.			
Current	Control Section	Included in the current consumption of the Command Option Attachable-Type SERVOPACK. Attachable-Type SERVOPACK. For 24-VDC power supply mA max., for 11-VDC po			
Consumption	DeviceNet Communications Section				

^{*2.} Externally connected terminating resistance is required.

^{*3.} Always perform risk assessment for the system and confirm that the safety requirements are met.

Selecting Cables

- ◆ System Configurations
- Σ-7S Single-axis Command Option Attachable-Type SERVOPACKs
- Command Option Module: DeviceNet Module



◆ Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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

Code			Length (L)	Order Number	Appearance
①	Analog Monitor Cable		1 m	JZSP-CA01-E	
2	Digital Opera Cable	ator Converter	0.3 m	JZSP-CVS05-A3-E*1	
3	Computer Ca	able	2.5 m	JZSP-CVS06-02-E	
		Soldered Conn	ector Kit	JZSP-CSI9-2-E	
		Connector-	0.5 m	JUSP-TA26P-E	
		Terminal Block Converter Unit (with cable)	1 m	JUSP-TA26P-1-E	
4	(with Cables) (Cables) (Cables		2 m	JUSP-TA26P-2-E	
		Cable with Loose Wires at One End (loose wires on peripheral device end)	1 m	JZSP-CSI02-1-E	1
			2 m	JZSP-CSI02-2-E	
			3 m	JZSP-CSI02-3-E	ib
		Cables with	1 m	JZSP-CVH03-01-E	L
	Safety Function	Safety Connectors*2	3 m	JZSP-CVH03-03-E	三••••
(S)	Device Cables Connector Kit*3		3	Contact Tyco Electronics Japan G.K. Product name: Industrial Mini I/O D-shape Type 1 Plug C nector Kit Model number: 2013595-1	
6	DeviceNet Communications Cable			DeviceNet communicat lowing Cable.	able must be an ODVA-Compliant ions cable. We recommend the fol-

^{*1.} This Converter Cable is required to use the Σ-III-series Digital Operator (JUSP-OP05A) for Σ-7-series SERVO-PACKs.

^{*2.} When using safety functions, connect this Cable to the safety function devices.

When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

^{*3.} Use the Connector Kit when you make cables yourself.

Σ-7S Single-axis FT82 SERVOPACKs **SGM7D Motor Drive**

Model Designations

















Σ-7S SERVOPACKs















1st+2nd+3rd digits

Maximum Applicable Motor Capacity

Voltage	Code	Specification
Three- phase,	2R8*1	0.4 kW
200 VAC	120*2	1.5 kW
Single- phase, 100 VAC	2R8	0.4 kW

4th digit Voltage

Code	Specification
Α	200 VAC
F	100 VAC

5th+6th digits Interface

Code	Specification
00	Analog voltage/pulse train reference
10	MECHATROLINK-II communications reference
20	MECHATROLINK-III communications reference
E0	Command Option Attachable Type*3



Hardware Options 8th+9th+10th digits

	- Specifica	20011
Code	Specification	Applicable Models
None	Without options	All models
000	Without options	Airmodels
001	Rack-mounted	All models
002	Varnished	All models
008	Single-phase, 200-VAC power supply input	SGD7S-120A
	No dynamic brake	SGD7S-2R8A
020*4	140 dynamic brake	SGD7S-2R8F
	External dynamic brake resistor	SGD7S-120A

11th+12th+13th digits FT/EX Specification

Code	Specification
F82 3	Application function option for special motors, SGM7D motor drive

BTO Specification*6 14th digit (Available in Japan only)

Code	Specification
None	None
В	BTO Specification

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A□0A008).
- *3. This interface is supported only by an INDEXER Module (model: SGDV-OCA03A).
- *4. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *5. Refer to the following manual for details.
 - (Manual No.: SIEP S800001 91)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-Phase, 200 VAC

	Model SGD7S	2R8A	120A	
Maximum App	licable Motor Capacity [0.4	1.5	
Continuous Ou	utput Current [Arms]		2.8	11.6
Instantaneous	Maximum Output Curre	nt [Arms]	9.3	28
Main Circuit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		2.5	7.3
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		0.2	0.2
Power Supply	Capacity [kVA]*		1.0	3.2
	Main Circuit Power Lo	ss [W]	22.5	72.6
Power Loss*	Control Circuit Power	Loss [W]	12	15
LOMEL F022.	Built-in Regenerative F	Resistor Power Loss [W]	_	10
	Total Power Loss [W]		34.5	97.6
Dogoporativo	Built-In Regenerative	Resistance $[\Omega]$	-	20
Regenerative Resistor	Resistor	Capacity [W]	_	60
	Minimum Allowable Ex	ternal Resistance [Ω]	40	20
Overvoltage C	ategory	I	II	

^{*} This is the net value at the rated load.

◆ Single-Phase, 200 VAC

	Model SGD7S	2R8A	120A	
Maximum App	licable Motor Capacity [0.4	1.5	
Continuous Ou	utput Current [Arms]		2.8	11.6
Instantaneous	Maximum Output Curre	nt [Arms]	9.3	28
Main Circuit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		5.0	16
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		0.2	0.25
Power Supply	Capacity [kVA]*		1.2	4.0
	Main Circuit Power Lo	ss [W]	23.7	71.8
Power Loss*	Control Circuit Power	Loss [W]	12	16
Lowel Fo22.	Built-in Regenerative F	Resistor Power Loss [W]	_	16
	Total Power Loss [W]		35.7	103.8
Demonstra	Built-In Regenerative	Resistance $[\Omega]$	_	12
Regenerative Resistor	Resistor	Capacity [W]	-	60
	Minimum Allowable Ex	ternal Resistance [Ω]	40	12
Overvoltage Ca	ategory	I	II	

^{*} This is the net value at the rated load.

Single-phase, 100 VAC

	Model SGD7S-	2R8F
Maximum App	licable Motor Capacity [kW]	0.4
Continuous Or	utput Current [Arms]	2.8
Instantaneous	Maximum Output Current [Arms]	9.3
Main Circuit	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz
	Input Current [Arms]*	10
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz
	Input Current [Arms]*	0.38
Power Supply	Capacity [kVA]*	1.4
	Main Circuit Power Loss [W]	26.2
Power Loss*	Control Circuit Power Loss [W]	12
	Total Power Loss [W]	38.2
Regenerative Resistor Minimum Allowable External Resistance $[\Omega]$		40
Overvoltage C	ategory	III

^{*} This is the net value at the rated load.

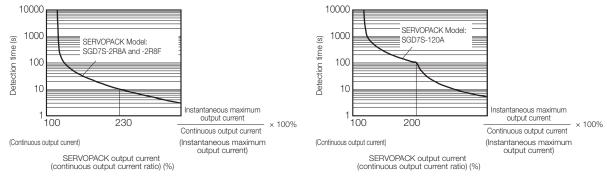
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

◆ FT82 SERVOPACKs with Analog Voltage/Pulse Train References

	Item		Specification		
Со	Control Method		IGBT-based PWM control, sine wave current drive		
Fee	edback	Serial encoder: 24 bits (incremental encoder/absolute encoder)			
	Surrounding Air Temperature*1	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications. **Derating Specifications** (page 397)			
	Storage Temperature	-20°C to	-20°C to 85°C		
	Surrounding Air Humidity	95% rela	tive humidity max. (with no freezing or condensation)		
	Storage Humidity	95% rela	tive humidity max. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s ²			
ons	Shock Resistance	19.6 m/s	2		
diti		Degree	SERVOPACK Models		
Environmental Conditions	Degree of Protection	IP20	SGD7S-2R8A, -120A (three-phase, 200-VAC input), and -2R8F		
men		IP10	SGD7S-120A00A008 (single-phase, 200-VAC input)		
Envir	Pollution Degree Altitude*1 Others	• Must b • Must b 1,000 m With dera Refer to a Do not us ject to st. or radioa	ating, usage is possible between 1,000 m and 2,000 m. the following section for derating specifications. ting Specifications (page 397) se the SERVOPACK in the following locations: Locations subatic electricity noise, strong electromagnetic/magnetic fields, ctivity		
	Applicable Standards		0-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, 1 group 1 class A, EN 61000-6-2, EN 61000-6-4, 0-3 (Category C2, Second environment), EN 50178, 0-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, 0-5-2, and IEC 61326-3-1		
IVIC	ounting	Base-mounted or rack-mounted			
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)			
Performance	Coefficient of Speed	±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)			
mai	Fluctuation*2	0% of rated speed max. (for a load fluctuation of ±10%)			
for	- Idotadioii	±0.1% of	rated speed max. (for a temperature fluctuation of 25°C ±25°C)		
Per	Torque Control Precision (Repeatability)	±1%			
	Soft Start Time Setting	0 s to 10	s (Can be set separately for acceleration and deceleration.)		

		Item	Continued from previous page. Specification	
En	code	r Divided Pulse Output	Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.	
	Fixed Input		Allowable voltage range: 5 VDC ±5% Number of input points: 1 SEN (Absolute Data Request) signal	
			Allowable voltage range: 24 VDC ±20% Number of input points: 7	
Sequence Input Signals	Input Signals That Can Be Allocated		Input method: Sink inputs or source inputs Input Signals • /S-ON (Servo ON) signal • /P-CON (Proportional Control) Signal • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /ALM-RST (Alarm Reset) signal • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /SPD-D (Motor Direction) signal • /SPD-A and /SPD-B (Internal Set Speed Selection) signals • /C-SEL (Control Selection) signal • /ZCLAMP (Zero Clamping) signal • /INHIBIT (Reference Pulse Inhibit) signal • /P-DET (Polarity Detection) signal • /G-SEL (Gain Selection) signal • /PSEL (Reference Pulse Input Multiplication Switch) Signal • SEN (Absolute Data Request) signal A signal can be allocated and the positive and negative logic can be changed	
	Fixe	ed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: ALM (Servo Alarm) signal	
Signals			Allowable voltage range: 5 VDC to 30 VDC Number of output points: 6 (A photocoupler output (isolated) is used for three of the outputs.) (An open-collector output (non-isolated) is used for the other three outputs.	
Sequence Output Sig	Output Signals That Can Be Allocated		Output Signals • /COIN (Positioning Completion) Signal • /V-CMP (Speed Coincidence Detection) Signal • /TGON (Rotation Detection) Signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) Signal • /VLT (Speed Limit Detection) Signal • /WLT (Speed Limit Detection) Signal • /BK (Brake) signal • /WARN (Warning) Signal • /NEAR (Near) signal • /PSELA (Reference Pulse Input Multiplication Switching Output) signal • ALO1, ALO2, and ALO3 (Alarm Code) signals A signal can be allocated and the positive and negative logic can be changed	
9	215	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)	
RS-422A	(CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port	
RS-7	CONTINUINGALIONS (CN3)	Axis Address Setting	Set with parameters.	
9	SIIS	Interface	Personal computer (with SigmaWin+)	
USB	Standard Interface Standard		Conforms to USB2.0 standard (12 Mbps).	
splay	s/Inc	licators	CHARGE indicator and five-digit seven-segment display	
		el Operator Four push switches		

Item			1.	tom	Continued from previous page.
			I	tem	Specification
An	Analog Monitor (CN5)		(CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)	
Dy	nami	ic Br	ake	(DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.
Re	gene	erativ	e Pr	ocessing	Built-in Built-In Regenerative Resistor (page 472)
Ov	ertra	vel (T)	Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal
Pro	otect	ive F	unc	tions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.
Uti	lity F	unct	ions		Gain adjustment, alarm history, jogging, origin search, etc.
>	SUC	Inp	uts		/HWBB1 and /HWBB2: Base block signals for Power Modules
Safety	Functions	Ou	tput		EDM1: Monitors the status of built-in safety circuit (fixed output).
S	Fur	App	olicat	ole Standards*3	ISO13849-1 PLe (Category 3) and IEC61508 SIL3
Ар	plica	ble (Optio	on Modules	Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.
		Sof	t Sta	art Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)
	0	Signal	Reference Voltage		 Maximum input voltage: ±12 V (forward motor rotation for positive reference). 6 VDC at rated speed (default setting). Input gain setting can be changed.
	Contro	Input	Inp	ut Impedance	Approx. 14 kΩ
	Ŏ		Cir	cuit Time Constant	30 μs
	Speed		Rotation Direction Selection		With Proportional Control signal
	SS	Internal Set Speed Control	Speed Selection		With Forward/Reverse External Torque Limit signals (speed 1 to 3 selection). Servomotor stops or another control method is used when both signals are OFF.
		Fee	dforv	vard Compensation	0% to 100%
			Output Signal Positioning Completed Width Setting		0 to 1,073,741,824 reference units
ntrols	_			Reference Pulse Form	One of the following is selected: Sign + pulse train, CW + CCW pulse trains, and two-phase pulse trains with 90° phase differential
OO	Position Control	Input Signals	Reference pulses	Input Form Maximum Input Frequency	 Line driver or open collector Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mpps Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps
				Input Multiplica- tion Switching	1 to 100 times
			Clear Signal		Position deviation clear Line driver or open collector
	Forque Control	Input Signal		ference Voltage	 Maximum input voltage: ±12 V (forward torque output for positive reference). 3 VDC at rated torque (default setting). Input gain setting can be changed.
	dne	out ;		ut Impedance	Approx. 14 kΩ
	Tor	In	Cir	cuit Time Constant	16 μs

^{*1.} If you combine a Σ -7-Series SERVOPACK with a Σ -V-Series Option Module, the following Σ -V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

 $\begin{tabular}{ll} Coefficient of speed fluctuation = & \hline No-load motor speed - Total-load motor speed \\ \hline Rated motor speed & \times 100\% \\ \hline \end{tabular}$

^{*2.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

^{*3.} Always perform risk assessment for the system and confirm that the safety requirements are met.

◆ FT82 SERVOPACK with MECHATROLINK-II Communications References

Item			Specification		
Со	Control Method		IGBT-based PWM control, sine wave current drive		
Fee	Feedback		Serial encoder: 24 bits (incremental encoder/absolute encoder)		
	Surrounding Air Temperature*1	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications. © Derating Specifications (page 397)			
	Storage Temperature	-20°C to	-20°C to 85°C		
	Surrounding Air Humidity	95% rela	tive humidity max. (with no freezing or condensation)		
	Storage Humidity	95% rela	tive humidity max. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s ²			
ons	Shock Resistance	19.6 m/s	2		
nditi		Degree	SERVOPACK Models		
Environmental Conditions	Degree of Protection	IP20	SGD7S-2R8A, -120A (three-phase, 200-VAC input), and -2R8F		
men		IP10	SGD7S-120A10A008 (single-phase, 200-VAC input)		
Enviro	Pollution Degree	Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 1,000 m or less.			
	Altitude*1	With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. **Derating Specifications** (page 397)			
	Others		se the SERVOPACK in the following locations: Locations sub- atic electricity noise, strong electromagnetic/magnetic fields, ctivity		
Ар	Applicable Standards		0-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, 1 group 1 class A, EN 61000-6-2, EN 61000-6-4, 0-3 (Category C2, Second environment), EN 50178, 0-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, 0-5-2, and IEC 61326-3-1		
Мо	unting	Base-mo	unted or rack-mounted		
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)			
9		±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)			
lanc	Coefficient of Speed	0% of rated speed max. (for a voltage fluctuation of ±10%)			
Performance	Fluctuation*2	±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)			
ď	Torque Control Precision (Repeatability)	±1%			
	Soft Start Time Setting	0 s to 10	s (Can be set separately for acceleration and deceleration.)		

			Item	Specification		
	End	code	er Divided Pulse Output	Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.		
	<u>s</u>			Allowable voltage range: 24 VDC ±20% Number of input points: 7		
	Sequence Input Signals	Input Signals That Can Be Allocated		Input method: Sink inputs or source inputs Input Signals • /DEC (Origin Return Deceleration Switch) signal • /EXT1 to /EXT3 (External Latch Input 1 to 3) signals • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /P-DET (Polarity Detection) signal A signal can be allocated and the positive and negative logic can be changed.		
I/O Signals		Fix	ed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: ALM (Servo Alarm) signal		
0/1	Sequence Output Signals		tput Signals That Can Allocated	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3 (A photocoupler output (isolated) is used.) Output Signals • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /VLT (Speed Limit Detection) signal • /WARN (Warning) signal • /WARN (Warning) signal • /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.		
	- i	Interfaces		Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)		
SL	422 <i>f</i>	(CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port		
mmunications	RS-422A	0)	Axis Address Setting	Set with parameters.		
mur	ú	,)	Interface	Personal computer (with SigmaWin+)		
Com	USB	(CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).		
Dis	splay	s/Inc	dicators	CHARGE, PWR, and COM indicators, and one-digit seven-segment display		
=		Со	mmunications Protocol	MECHATROLINK-II		
MECHATROLINK-II	Communications	Station Address Settings		41 to 5F hex (maximum number of slaves: 30) Selected with the combination of a rotary switch (S2) and DIP switch (S3).		
IATRC	munic	Baud Rate		Baud Rate 10 Mbps, 4 Mbps A DIP switch (S3) is used to select the baud rate.		A DIP switch (S3) is used to select the baud rate.
넊	mo;		nsmission Cycle	250 μs or 0.5 ms to 4.0 ms (multiples of 0.5 ms)		
Ĭ	0	Nu Byt	mber of Transmission es	17 or 32 bytes/station A DIP switch (S3) is used to select the number of transmission bytes.		
Reference	poq	Per	formance	Position, speed, or torque control with MECHATROLINK-II communications		
Refer	Method	Ref	ference Input	MECHATROLINK-I or MECHATROLINK-II commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)		
ME	ECHA	ATRO)LINK-II	Rotary switch (S2) positions: 16		
			nications Setting Switches Number of DIP switch (S3) pins: 4			
	-			Continued on next nage		

	Item	Specification	
Analog	Monitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)	
Dynam	ic Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.	
Regene	erative Processing	Built-in Built-In Regenerative Resistor (page 472)	
Overtra	avel (OT) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal	
Protect	tive Functions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.	
Utility F	unctions	Gain adjustment, alarm history, jogging, origin search, etc.	
	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules	
Safety Functions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).	
Sur	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3	
Applicable Option Modules		Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.	

^{*1.} If you combine a Σ -7-Series SERVOPACK with a Σ -V-Series Option Module, the following Σ -V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

Coefficient of speed fluctuation = $\frac{\text{No-load motor speed - Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

^{*2.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

^{*3}. Always perform risk assessment for the system and confirm that the safety requirements are met.

◆ FT82 SERVOPACK with MECHATROLINK-III Communications References

Item			Specification	
Drive Method		IGBT-bas	ed PWM control, sine wave current drive	
Fee	Feedback		Serial encoder: 24 bits (incremental encoder/absolute encoder)	
	Surrounding Air Temperature*1	Refer to t	5°C Iting, usage is possible between 55°C and 60°C. he following section for derating specifications. Iting Specifications (page 397)	
	Storage Temperature	-20°C to	85°C	
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)		
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)		
	Vibration Resistance	4.9 m/s ²		
NS	Shock Resistance	19.6 m/s ²		
ditio	Degree of Protection	Degree	SERVOPACK Models	
Environmental Conditions		IP20	SGD7S-2R8A, -120A (three-phase, 200-VAC input), and -2R8F	
ment		IP10	SGD7S-120A20A008 (single-phase, 200-VAC input)	
En	Pollution Degree Altitude*1	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. Derating Specifications (page 397) Do not use the SERVOPACK in the following locations: Locations sub- 		
	Others	ject to static electricity noise, strong electromagnetic/magnetic fields or radioactivity		
Applicable Standards		EN 55011 EN 61800 EN 61800	0-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, group 1 class A, EN 61000-6-2, EN 61000-6-4, 0-3 (Category C2, Second environment), EN 50178, 0-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, 0-5-2, and IEC 61326-3-1	
Мо	ounting	Base-mounted or rack-mounted		
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)		
Performance	Coefficient of Speed Fluctuation*2	±0.01% of rated speed max. (for a load fluctuation of 0% to 100%) 0% of rated speed max. (for a load fluctuation of ±10%) ±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)		
	Torque Control Precision (Repeatability)	±1%		
	Soft Start Time Setting	0 s to 10	s (Can be set separately for acceleration and deceleration.)	

Continued from previous page				
Item			Item	Specification
//O Signals	End	Encoder Divided Pulse Output		Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.
	sli			Allowable voltage range: 24 VDC ±20% Number of input points: 7
	Input Signals That Can Be Allocated			Input method: Sink inputs or source inputs Input Signals • /DEC (Origin Return Deceleration Switch) signal • /EXT1 to /EXT3 (External Latch Input 1 to 3) signals • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /P-DET (Polarity Detection) signal A signal can be allocated and the positive and negative logic can be changed.
	ut Signals	Fixed Output		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: ALM (Servo Alarm) signal
		Output Signals That Can Be Allocated		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3 (A photocoupler output (isolated) is used.) Output Signals
	Sequence Output Signals			 /COIN (Positioning Completion) signal /V-CMP (Speed Coincidence Detection) signal /TGON (Rotation Detection) signal /S-RDY (Servo Ready) signal /CLT (Torque Limit Detection) signal /VLT (Speed Limit Detection) signal /BK (Brake) signal /WARN (Warning) signal /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.
	و	2	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)
"	ZA zejer))	1:N Communications	Up to N = 15 stations possible for RS-422A port
ommunications	RS-422A	(CN3)	Axis Address Setting	Set with parameters.
mui	B.	0.10	Interface	Personal computer (with SigmaWin+)
Comn	USB	(CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).
Dis	Displays/Indicators			CHARGE, PWR, CN, L1, and L2 indicators, and one-digit seven-segment display
		Со	mmunications Protocol	MECHATROLINK-III
II-XV	ıtions	Station Address Settings		03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.
Š	Jice	Baud Rate		100 Mbps
MECHATROLINK-III	Communications	Transmission Cycle		125 μs, 250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms)
	ŏ	Number of Transmission Bytes		32 or 48 bytes/station A DIP switch (S3) is used to select the number of transmission bytes.
Φ	_	Performance		Position, speed, or torque control with MECHATROLINK-III communications
Reference	Method	Reference Input		MECHATROLINK-III commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)
Ä	_	Profile		MECHATROLINK-III standard servo profile
ME	MECHATROLINK-III			Rotary switch (S1 and S2) positions: 16
	Communications Setting Switches			Number of DIP switch (S3) pins: 4
3 1				

Item		Specification	
Analog	Monitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)	
Dynam	ic Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.	
Regenerative Processing		Built-in Built-In Regenerative Resistor (page 472)	
Overtra	ivel (OT) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal	
Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.	
Utility Functions		Gain adjustment, alarm history, jogging, origin search, etc.	
/ ns	Inputs	/HWBB1 and /HWBB2: Base block signals for Power Modules	
Safety -unctions	Output	EDM1: Monitors the status of built-in safety circuit (fixed output).	
S III	Applicable Standards*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3	
Applicable Option Modules		Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.	

^{*1.} If you combine a Σ-7-Series SERVOPACK with a Σ-V-Series Option Module, the following Σ-V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

 $\mbox{Coefficient of speed fluctuation} = \frac{\mbox{No-load motor speed - Total-load motor speed}}{\mbox{Rated motor speed}} \times 100\%$

^{*2.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

^{*3.} Always perform risk assessment for the system and confirm that the safety requirements are met.

Command Option Attachable-type FT82 SERVOPACKs with INDEXER Modules

The specifications when the INDEXER Module is combined with a Command Option Attachable-type SERVOPACK are given in the following table.

Item		Specification		
Со	ntrol Method	IGBT-based PWM control, sine wave current drive		
Fee	edback	Serial encoder: 24 bits (incremental encoder/absolute encoder)		
	Surrounding Air Temperature	0°C to 55°C		
	Storage Temperature	-20°C to 85°C		
	Surrounding Air Humidity	90% relative humidity max. (with no freezing or condensation)		
NS	Storage Humidity	90% relative humidity max. (with no freezing or condensation)		
ditio	Vibration Resistance	4.9 m/s ²		
òno	Shock Resistance	19.6 m/s ²		
<u>a</u>	Degree of Protection	IP10		
Environmental Conditions	Pollution Degree	Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust.		
ш	Altitude	1,000 m or less.		
	Others	Do not use the SERVOPACK in the following locations: Locations su ject to static electricity noise, strong electromagnetic/magnetic field or radioactivity		
Applicable Standards		UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1		
Mounting		Base-mounted or rack-mounted		
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control rang must not cause the Servomotor to stop.)		
Ф	Coefficient of Speed Fluctuation*1	±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)		
Performance		0% of rated speed max. (for a voltage fluctuation of ±10%)		
		±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)		
	Torque Control Precision (Repeatability)	±1%		
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)		
I/O Signals	Encoder Divided Pulse Output	Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.		

	Item Specification Continued from previous p			
		Item	Allowable voltage range: 24 VDC ±	
			Number of input points: 6	.2070
S	SERVOPACK		Input method: Sink inputs or source Input signals: • /ALM-RST (Alarm Reset) signal • P-OT (Forward Drive Prohibit) sig • N-OT (Reverse Drive Prohibit) sig • /DEC (Origin Return Deceleration • /RGRT (Registration Input) signal • /S-ON (Servo ON) signal Positive or negative logic can be ch	nal nal) switch
Signals			Allowable voltage range: 24 VDC ±	
rt Si			Number of input points: 11	
Inpu		Fixed Inputs	/MODE 0/1 (Mode Switch Input) sig	
ool			Mode 0	Mode 1
I/O Signals Sequence Input	INDEXER Module		/START-STOP (Program Table Operation Start-Stop Input) signal /PGMRES (Program Table Operation Reset Input) signal /SEL0 (Program Step Selection Input 0) signal /SEL1 (Program Step Selection Input 1) signal /SEL2 (Program Step Selection Input 2) signal /SEL3 (Program Step Selection Input 3) signal /SEL4 (Program Step Selection Input 4) signal /SEL5 (Program Step Selection Input 5) signal /SEL6 (Program Step Selection Input 6) signal /SEL7 (Program Step Selection Input 7) signal	 /HOME (Origin Return Input) signal /JOGP (Forward Jog Input) signal /JOGN (Reverse Jog Input) signal /JOGO (Jog Speed Table Selection Input 0) signal /JOG1 (Jog Speed Table Selection Input 1) signal /JOG2 (Jog Speed Table Selection Input 2) signal /JOG3 (Jog Speed Table Selection Input 3) signal
		Fixed Outputs	Allowable voltage range: 5 VDC to Number of output points: 1 Output signal: ALM (Servo Alarm C	Output) signal
	PACK	X	Allowable voltage range: 5 VDC to Number of output points: 3 (A photocoupler output (isolated) is	
Output Signals	Sign	Output Signals for Which Allocations Can Be Changed	Output signals: • /WARN (Warning Output) signal • /BK (Brake Output) signal • /S-RDY (Servo Ready Output) sig • /ALO1, /ALO2, and /ALO3 (Alarm Signal allocations and positive or n parameters.	
Sequence Output	INDEXER Module	Fixed Outputs	Allowable voltage range: 5 VDC to Number of output points: 9 Output signals: • /INPOSITION (Positioning Comple) • /POUT0 (Programmable Output 0) • /POUT1 (Programmable Output 0) • /POUT3 (Programmable Output 0) • /POUT4 (Programmable Output 0) • /POUT5 (Programmable Output 0) • /POUT6 (Programmable Output 0) • /POUT6 (Programmable Output 0) • /POUT7 (Programmable Output 0)	etion Output) signal)) signal 1) signal 2) signal 3) signal 4) signal 5) signal 5) signal

Item Specification				
		пеш	·	
	RS-422A Communications (CN3)	Interfaces	Digital Operator (JUSP-OP05A-1-E), Personal computer (with SigmaWin+)	
ons	RS-422A nmunicatio (CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port	
Communications	Com	Axis Address Setting	Set with parameters.	
mur	SUC	Interface	Personal computer (with SigmaWin+)	
Com	USB Communications (CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).	
S/	SERVO	PACK	CHARGE and PWR indicators, and one-digit seven-segment display	
Displays/ Indicators	INDEXE	R Module	Refer to the following manual for details. Σ-7-Series Σ-7S Command Option Attachable-type SERVOPACK with INDEXER Module Product Manual (Manual No.: SIEP S800001 64)	
spc		n Table Method	 Program table positioning in which steps are executed sequentially by commands given through contact input or serial communications Positioning in which station numbers are specified by commands given through contact input or serial communications 	
ethc		x. Number of Steps	256	
Ž	Ma	x. Number of Tables	256	
ıting	Max. Number of Stations		256	
Opera	Max. Number of Steps Max. Number of Tables Max. Number of Stations Max. Number of Stations Serial Communications Method		Serial command by 1-channel ASCII code Communications specifications:RS-422/485 (50 m max.) Connection topology:Multi-drop connection (16 axes max.) Baud rate:9600, 19200, 38400 bps	
	Other Functions		Registration (positioning by external signals), origin return	
An	Analog Monitor (CN5)		Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)	
Dy	namic Br	ake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.	
Re	generativ	re Processing	Built-in Built-In Regenerative Resistor (page 472)	
Ov	Overtravel (OT) Prevention		Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal	
	Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.	
Uti	lity Funct		Gain adjustment, alarm history, jogging, origin search, etc.	
>	g Inp	uts	/HWBB1 and /HWBB2: Base block signals for Power Modules	
Safety	Functions On On On	tput	EDM1: Monitors the status of built-in safety circuit (fixed output).	
	⊒ Ap	plicable Standards*2	ISO13849-1 PLe (Category 3), IEC61508 SIL3	
Ар	plicable (Option Modules	Fully-Closed Module Note: You cannot use a Safety Module if you are using an INDEXER Module.	

^{*1.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

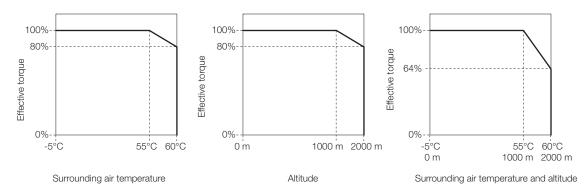
Coefficient of speed fluctuation = $\frac{\text{No-load motor speed - Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

^{*2.} Always perform risk assessment for the system and confirm that the safety requirements are met.

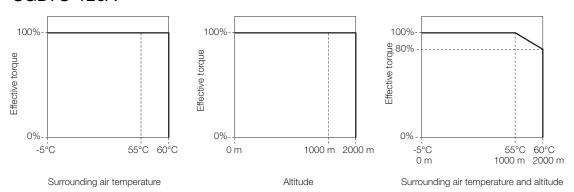
Derating Specifications

If you use the SERVOPACK at a surrounding air temperature of 55°C to 60°C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

◆ SGD7S-2R8A and -2R8F

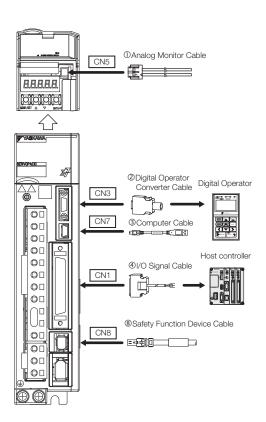


◆ SGD7S-120A

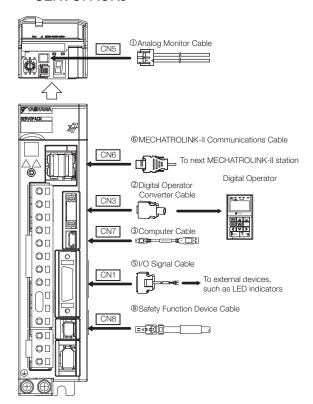


Selecting Cables

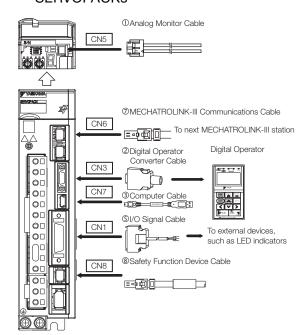
- System Configurations
- Σ-7S Single-axis Analog Voltage/Pulse Train Reference SERVOPACKs



 Σ-7S Single-axis MECHATROLINK-II Communications Reference SERVOPACKs

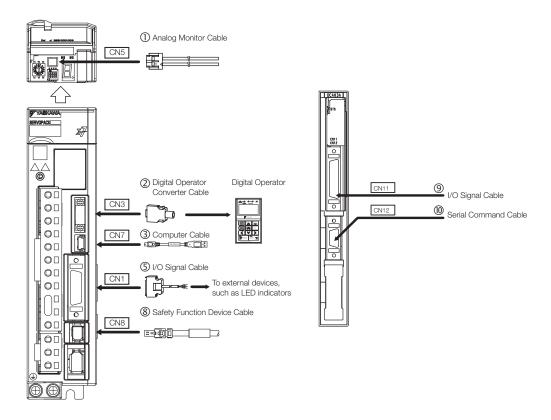


■ Σ-7S Single-axis MECHATROLINK-III Communications Reference SERVOPACKs



■ Σ-7S Single-axis Command Option Attachable-Type SERVOPACKs

■ Command Option Module: INDEXER Module



◆ Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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

Code	Name	Length (L)	Order Number	Appearance
1	Analog Monitor Cable	1 m	JZSP-CA01-E	
2	Digital Operator Converter Cable	0.3 m	JZSP-CVS05-A3-E*1	
(2)			JZSP-CVS07-A3-E*2	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

Continued on next page.

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	Continued from previous p				
Code	Name Length (L)			Order Number	Appearance
		Soldered Connector Kit		JZSP-CSI9-1-E	
		Connector-	0.5 m	JUSP-TA50PG-E	
		Terminal Block Con-	1 m	JUSP-TA50PG-1-E	
4	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA50PG-2-E	
		Cable with Loose Wires	1 m	JZSP-CSI01-1-E	
		at One End (loose wires	2 m	JZSP-CSI01-2-E	
		on peripheral device end)	3 m	JZSP-CSI01-3-E	
		Soldered Conn	ector Kit	JZSP-CSI9-2-E	
		Connector-	0.5 m	JUSP-TA26P-E	[
		Terminal Block Con-	1 m	JUSP-TA26P-1-E	
(\$)	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA26P-2-E	
		Cable with Loose Wires at One End (loose wires on peripheral device end)	1 m	JZSP-CSI02-1-E	
			2 m	JZSP-CSI02-2-E	
			3 m	JZSP-CSI02-3-E	
			0.5 m	JEPMC-W6002-A5-E	
		Cables with	1 m	JEPMC-W6002-01-E	
			3 m	JEPMC-W6002-03-E	
			5 m	JEPMC-W6002-05-E	L L
		Connectors on Both Ends	10 m	JEPMC-W6002-10-E	
		OH DOUT ENDS	20 m	JEPMC-W6002-20-E	
			30 m	JEPMC-W6002-30-E	
	MECHATRO		40 m	JEPMC-W6002-40-E	
	LINK-II		50 m	JEPMC-W6002-50-E JEPMC-W6003-A5-E	
6	Communi-		1 m	JEPMC-W6003-A5-E	
	cations Cables		3 m	JEPMC-W6003-01-E	
	Janes	Cables with	5 m	JEPMC-W6003-05-E	
		Connectors on Both Ends	10 m	JEPMC-W6003-03-L	-
		(with ferrite	20 m	JEPMC-W6003-10-E	
		cores)	30 m	JEPMC-W6003-30-E	
			40 m	JEPMC-W6003-40-E	
			50 m	JEPMC-W6003-40-E	
		Terminators		JEPMC-W6022-E	

	Continued from prev					
Code	N	ame	Length (L)	Order Number	Appearance	
			0.2 m	JEPMC-W6012-A2-E		
			0.5 m	JEPMC-W6012-A5-E		
			1 m	JEPMC-W6012-01-E		
			2 m	JEPMC-W6012-02-E		
		Cables with	3 m	JEPMC-W6012-03-E		
		Connectors	4 m	JEPMC-W6012-04-E		
		on Both Ends	5 m	JEPMC-W6012-05-E	- 三·• 倒回 回廊 ·=	
			10 m	JEPMC-W6012-10-E		
			20 m	JEPMC-W6012-20-E		
	MECHATRO		30 m	JEPMC-W6012-30-E		
	LINK-III		50 m	JEPMC-W6012-50-E		
7	Communi- cations	Cables with	10 m	JEPMC-W6013-10-E		
	Cables	Connectors	20 m	JEPMC-W6013-20-E	<u> </u>	
	00.0.00	on Both Ends	30 m	JEPMC-W6013-30-E	三吨侧门	
		(with core)	50 m	JEPMC-W6013-50-E		
		Cable with Loose Wires at One End	0.5 m	JEPMC-W6014-A5-E		
			1 m	JEPMC-W6014-01-E		
			3 m	JEPMC-W6014-03-E		
			5 m	JEPMC-W6014-05-E	三中國	
			10 m	JEPMC-W6014-10-E		
			30 m	JEPMC-W6014-30-E		
			50 m	JEPMC-W6014-50-E		
		0 1 1	1 m	JZSP-CVH03-01-E	L	
	Safety	Cables with Connectors*3	3 m	JZSP-CVH03-03-E	→	
8	Function			Contact Tues Fleetrenic		
•	Device			Contact Tyco Electronic	nics Japan G.K. trial Mini I/O D-shape Type 1 Plug Con-	
	Cables	Connector Kit*	1	nector Kit		
				Model number: 2013595-1		
		Connector Kit		DP9420007-E		
		Cables with	1 m	JZSP-CVI01-1-E		
	1/0 0:	Loose Wires	2 m	JZSP-CVI01-2-E		
9	I/O Signal Cables	at One End	3 m	JZSP-CVI01-3-E		
	Cables	Cables with Terminal Block on One End	0.5 m	JUSP-TA36V-E		
			1 m	JUSP-TA36V-1-E		
			2 m	JUSP-TA36V-2-E		
					Contact Yaskawa Controls Co., Ltd.	
	Serial Com-		4		for the cable.	
10	mand Cable	Connector Kit*4		JZSP-CHI9-1		

^{*1.} This Converter Cable is required to use the Σ-III-series Digital Operator (JUSP-OP05A) for Σ-7-series SERVO-PACKs

^{*2.} If you use a MECHATROLINK-III Communications Reference SERVOPACK, this Converter Cable is required to prevent the cable from disconnecting from the Digital Operator.

^{*3.} When using safety functions, connect this Cable to the safety function devices.

When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

^{*4.} Use the Connector Kit when you make cables yourself.

Σ-7S Single-axis FT83 SERVOPACKs SGM7D Motor Drive with built-in INDEXER

Model Designations

















 Σ -7 Series Σ-7S SERVOPACKs













1st+2nd+3rd digits

Maximum Applicable Motor Capacity

Voltage	Code	Specification
Three- phase,	2R8*1	0.4 kW
200 VAC	120*2	1.5 kW
Single- phase, 100 VAC	2R8	0.4 kW



Code	Specification
Α	200 VAC
F	100 VAC

5th+6th digits Interface

Code	Specification
00	Analog voltage/pulse train reference



Hardware Options

Specification					
Code	Specification	Applicable Models			
None	Without options	All models			
000	without options				
001	Rack-mounted	All models			
002	Varnished	All models			
008	Single-phase, 200-VAC power supply input	SGD7S-120A			
	No dynamic brake	SGD7S-2R8A			
020*3	TNO Gyriaitiic Diake	SGD7S-2R8F			
020	External dynamic brake resistor	SGD7S-120A			

11th+12th+13th digits FT/EX Specification

Code	Specification	
F83*4	Application function option for special motors, SGM7D motor drive, indexing	

BTO Specification*5 (Available in Japan only)

Code	Specification	
None	None	
В	BTO Specification	

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A00A008).
- *3. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *4. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for SGM7D Motor Product Manual (Manual No.: SIEP S800001 91)
- *5. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-Phase, 200 VAC

	Model SGD7S	2R8A	120A	
Maximum App	licable Motor Capacity [0.4	1.5	
Continuous Ou	utput Current [Arms]	2.8	11.6	
Instantaneous	Maximum Output Curre	nt [Arms]	9.3	28
Main Circuit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		2.5	7.3
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		0.2	0.2
Power Supply	Capacity [kVA]*	1.0	3.2	
	Main Circuit Power Lo	ss [W]	22.5	72.6
Power Loss*	Control Circuit Power	Loss [W]	12	15
LOMEL FO22.	Built-in Regenerative F	Resistor Power Loss [W]	_	10
	Total Power Loss [W]		34.5	97.6
Degenerative	Built-In Regenerative	Resistance $[\Omega]$	_	20
Regenerative Resistor	Resistor	Capacity [W]	-	60
	Minimum Allowable Ex	ternal Resistance [Ω]	40	20
Overvoltage C	ategory	I	II	

^{*} This is the net value at the rated load.

◆ Single-Phase, 200 VAC

	Model SGD7S	2R8A	120A	
Maximum App	licable Motor Capacity [0.4	1.5	
Continuous Ou	utput Current [Arms]		2.8	11.6
Instantaneous	Maximum Output Curre	nt [Arms]	9.3	28
Main Circuit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		5.0	16
Control	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz	
	Input Current [Arms]*		0.2	0.25
Power Supply	Capacity [kVA]*		1.2	4.0
	Main Circuit Power Loss [W]		23.7	71.8
Power Loss*	Control Circuit Power	Loss [W]	12	16
Lowel Fo22.	Built-in Regenerative Resistor Power Loss [W]		_	16
	Total Power Loss [W]		35.7	103.8
Demonstra	Built-In Regenerative	Resistance $[\Omega]$	_	12
Regenerative Resistor	Resistor	Capacity [W]	_	60
1 10010101	Minimum Allowable Ex	ternal Resistance [Ω]	40	12
Overvoltage C	Overvoltage Category			II

^{*} This is the net value at the rated load.

◆ Single-phase, 100 VAC

	Model SGD7S-	2R8F
Maximum App	licable Motor Capacity [kW]	0.4
Continuous O	utput Current [Arms]	2.8
Instantaneous	Maximum Output Current [Arms]	9.3
Main Circuit	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz
Mairi Circuit	Input Current [Arms]*	10
Control	Power Supply	100 VAC to 120 VAC, -15% to +10%, 50 Hz/60 Hz
Control	Input Current [Arms]*	0.38
Power Supply	Capacity [kVA]*	1.4
	Main Circuit Power Loss [W]	26.2
Power Loss*	Control Circuit Power Loss [W]	12
	Total Power Loss [W]	38.2
Regenerative Minimum Allowable External Resistor Resistance $[\Omega]$		40
Overvoltage C	ategory	III

^{*} This is the net value at the rated load.

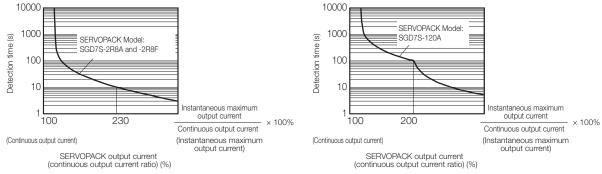
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

◆ FT83 SERVOPACKs with Analog Voltage/Pulse Train References

	Item	Specification
Со	ntrol Method	IGBT-based PWM control, sine wave current drive
Fee	edback	Serial encoder: 24 bits (incremental encoder/absolute encoder)
	Surrounding Air Temperature*1	0°C to 55°C
	Storage Temperature	-20°C to 85°C
	Surrounding Air Humidity	90% relative humidity max. (with no freezing or condensation)
NS	Storage Humidity	90% relative humidity max. (with no freezing or condensation)
ditio	Vibration Resistance	4.9 m/s ²
Sono	Shock Resistance	19.6 m/s ²
a C	Degree of Protection	IP10
Environmental Conditions	Pollution Degree	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust.
ш	Altitude*1	1,000 m max.
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electro- magnetic/magnetic fields, or radioactivity
Ар	plicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN ISO13849-1: 2015, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, EN 61800-5-1, IEC 60204-1, IEC 61508 series, IEC 62061, IEC 61800-5-2, and IEC 61326-3-1
Мс	ounting	Base-mounted or rack-mounted
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)
ool		$\pm 0.01\%$ of rated speed max. (for a load fluctuation of 0% to 100%)
nar	Coefficient of Speed Fluctuation*2	0% of rated speed max. (for a load fluctuation of ±10%)
Performance		±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)
_	Torque Control Precision (Repeatability)	±1%
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)
I/O Signals	Encoder Divided Pulse Output	Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.
		Continued on next nage

Item		Item	Specification		
			Fixed Input	Allowable voltage range: 5 VDC ±5% Number of input points: 1 SEN (Absolute Data Request) signal	
I/O Signals	Sequence Input Signals	SERVOPACKs		Allowable voltage range: 5 VDC ±5% Number of input points: 1 SEN (Absolute Data Request) signal Number of input points: 1 Input method: Line driver or open collector Input Signals · /DEC (Origin Return Deceleration Switch) signal · /RGRT (Registration Input) signal · CLR (Clear) signal Allowable voltage range: 24 VDC ±20% Number of input points: 7 Input method: Sink inputs or source inputs Input Signals · /S-ON (Servo ON) signal · /P-CON (Proportional Control) Signal · P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals · /ALM-RST (Alarm Reset) signal · /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals · /SPD-A and /SPD-B (Internal Set Speed Selection) signals · /C-SEL (Control Selection) signal · /INHIBIT (Reference Pulse Inhibit) signal · /P-DET (Polarity Detection) signal · /G-SEL (Gain Selection) signal · /G-SEL (Reference Pulse Input Multiplication Switch) Signal · /PSEL (Reference Pulse Input Multiplication Switch) Signal	
				 /MODE 0/1 (Mode Switch Input) signal /START-STOP (Program Table Operation Start-Stop Input) signal /JOGP (Forward Jog Input) signal /JOGN (Reverse Jog Input) signal /HOME (Origin Return Input) signal /PGMRES (Program Table Operation Reset Input) signal /SEL0 (Program Step Selection Input 0) signal /SEL1 (Program Step Selection Input 1) signal /SEL2 (Program Step Selection Input 2) signal /SEL3 (Program Step Selection Input 3) signal /SEL4 (Program Step Selection Input 4) signal /JOG0 (Jog Speed Table Selection Input 0) signal /JOG1 (Jog Speed Table Selection Input 1) signal /JOG2 (Jog Speed Table Selection Input 2) signal A signal can be allocated and the positive and negative logic can be changed. 	

				Continued from previous page.		
			Item	Specification		
				Allowable voltage range: 5 VDC to 30 VDC		
		-			Fixed Output	Number of output points: 1
				Output signal: ALM (Servo Alarm) signal		
				Allowable voltage range: 5 VDC to 30 VDC		
				Number of output points: 6		
		Sequence Output Signals SERVOPACKs		(A photocoupler output (isolated) is used for three of the outputs.) (An open-collector output (non-isolated) is used for the other three outputs.)		
				Output Signals		
				/COIN (Positioning Completion) Signal		
	als			N-CMP (Speed Coincidence Detection) Signal		
	ğ			/TGON (Rotation Detection) Signal		
<u>8</u>	5			/S-RDY (Servo Ready) signal		
I/O Signals	ntpr	Æ		/CLT (Torque Limit Detection) Signal		
Š	Õ	9	Output Cianala That Can Da	VLT (Speed Limit Detection) Signal (DL/ (Drake) signal		
9)Ce	EB	Output Signals That Can Be Allocated	/BK (Brake) signal/WARN (Warning) Signal		
	ner	S	Allocated	NEAR (Near) signal		
	Sed			PSELA (Reference Pulse Input Multiplication Switching Output) signal		
	0)			• /ALO1, /ALO2, and /ALO3 (Alarm Code) signals		
				 /POUT0 (Programmable Output 0) signal 		
				POUT1 (Programmable Output 1) signal		
				POUT2 (Programmable Output 2) signal Output 2) signal		
				/POUT3 (Programmable Output 3) signal/POUT4 (Programmable Output 4) signal		
				POSRDY (Origin Return Completed Output) signal		
				DEN (Position Reference Distribution Completed) signal		
				A signal can be allocated and the positive and negative logic can be changed.		
	ator	Suo	Interfaces	Digital Operator (JUSP-OP05A-1-E)		
ons	Opera	Communications (CN3)	1:N Communications	Up to N = 15 stations possible for RS-422A port		
Communications	Digital Operator		Axis Address Setting	Set with parameters.		
ШШ		TIONS	Interface	Personal computer (with SigmaWin+)		
ОШ	NSB .	nunica (CN7)	Camara unicationa Otamaland	Conformed to LICEO O standard (10 Miles)		
	_	Communications (CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).		
Displays/ Indicators	SERVOPACK		PACK	CHARGE indicator and five-digit seven-segment display		
	nel (Opera	ator	Four push switches		
SS				Program table positioning in which steps are executed in		
Operating Methods	Pr	narai	n Table	sequence with commands from contact inputs		
Me	1 1	ograi	Trable	Positioning by specifying station numbers with commands		
ating			N. I. CO.	from contact inputs		
per	\sim		x. Number of Steps	256 steps (32 steps max. if input signals are used)		
	Οl	ner r	unctions	Registration (positioning with external signals) and origin returns.		
				Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V)		
			(01)	Resolution: 16 bits		
An	alog	Mor	nitor (CN5)	Accuracy: ±20 mV (Typ)		
				Maximum output current: ±10 mA		
				Settling time (±1%): 1.2 ms (Typ)		
Dy	nam	iic Br	ake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.		
Regenerative Processing		erativ	ve Processing	Built-in Built-In Regenerative Resistor (page 472)		
Ov	ertra	avel (OT) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal		
Pro	otect	tive F	unctions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.		
	0			Continued on next need		

Item		Item	Specification		
			Gain adjustment, alarm history, jogging, origin search, etc.		
	ns	Inp	uts		/HWBB1 and /HWBB2: Base block signals for Power Modules
Safety	Functions	Ou	tput		EDM1: Monitors the status of built-in safety circuit (fixed output).
ഗ്	Fun	Apı	olica	ıble Standards*3	ISO13849-1 PLe (Category 3) and IEC61508 SIL3
Ар	plica	ble (Optio	on Modules	Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Module together.
		Sof	t St	art Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)
	Control	ıt Signal	Re	ference Voltage	Note: You cannot use a Fully-closed Module and a Safety Modutogether. 0 s to 10 s (Can be set separately for acceleration and deceleration.) • Maximum input voltage: ±12 V (forward motor rotation positive reference). • 6 VDC at rated speed (default setting). Input gain setting can be changed. Approx. 14 kΩ 30 μs ection With Proportional Control signal With Forward/Reverse External Torque Limit signals (spe 1 to 3 selection). Servomotor stops or another control method is used who both signals are OFF. On 0% to 100% Completed One of the following is selected: Sign + pulse train, CW + CCW pulse trains, and two-phapulse trains with 90° phase differential Line driver or open collector • Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 M
	ŏ	Input	Inp	out Impedance	Approx. 14 kΩ
	Speed (_ ,	Cir	cuit Time Constant	30 μs
	Sp		Ro	tation Direction Selection	With Proportional Control signal
		Internal Set Speed Control	Sp	eed Selection	Gain adjustment, alarm history, jogging, origin search, etc. /HWBB1 and /HWBB2: Base block signals for Power Modul EDM1: Monitors the status of built-in safety circuit (fixed output ISO13849-1 PLe (Category 3) and IEC61508 SIL3 Fully-closed Modules and Safety Modules Note: You cannot use a Fully-closed Module and a Safety Modul together. 0 s to 10 s (Can be set separately for acceleration and deceleration.) • Maximum input voltage: ±12 V (forward motor rotation for positive reference). • 6 VDC at rated speed (default setting). Input gain setting can be changed. Approx. 14 kΩ 30 μs With Proportional Control signal With Forward/Reverse External Torque Limit signals (speed to 3 selection). Servomotor stops or another control method is used whe both signals are OFF. On 0% to 100% I Completed O to 1,073,741,824 reference units One of the following is selected: Sign + pulse train, CW + CCW pulse trains, and two-phase pulse trains with 90° phase differential: Line driver or open collector • Line Driver Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mp • Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-phase pulse trains with 90° phase differential: 200 kpps Two-Dase pulse trains with 90° phase differential: 200 kpps Two-Dase pulse trains with 90° phase differential: 200 kpps Two-Dase pulse trains with 90° phase differential: 1 Mp • Open Collector • Maximum input voltage: ±12 V (forward torque output for positive reference). • 3 VDC at r
		Fee	edfo	rward Compensation	0% to 100%
				Signal Positioning Completed Setting	0 to 1,073,741,824 reference units
Controls				Reference Pulse Form	Sign + pulse train, CW + CCW pulse trains, and two-phase
Ö	<u>lo</u>		SS	Input Form	Line driver or open collector
	Position Control	Input Signals	Reference Pulses	Maximum Input Frequency	Sign + pulse train or CW + CCW pulse trains: 4 Mpps Two-phase pulse trains with 90° phase differential: 1 Mpps • Open Collector Sign + pulse train or CW + CCW pulse trains: 200 kpps Two-phase pulse trains with 90° phase differential: 200
				Input Multiplication Switching	1 to 100 times
			Clear Signal		Line driver or open collector
	Torque Control	Input Signal		ference Voltage	3 VDC at rated torque (default setting). Input gain setting can be changed.
	orqu	Inp		ut Impedance	Approx. 14 kΩ
Circuit Time Constant		cuit Time Constant	16 μs		

^{*1.} If you combine a Σ -7-Series SERVOPACK with a Σ -V-Series Option Module, the following Σ -V-Series SERVO-PACKs specifications must be used: a surrounding air temperature of 0°C to 55°C and an altitude of 1,000 m max. Also, the applicable surrounding range cannot be increased by derating.

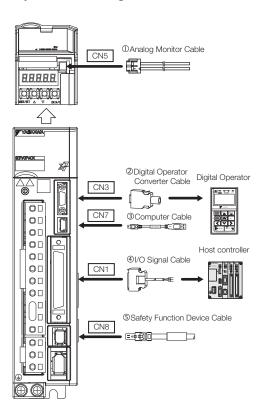
Coefficient of speed fluctuation = No-load motor speed - Total-load motor speed × 100% Rated motor speed

^{*2.} The coefficient of speed fluctuation for load fluctuation is defined as follows:

^{*3}. Always perform risk assessment for the system and confirm that the safety requirements are met.

Selecting Cables

◆ System Configurations



Σ-7S Single-axis FT83 SERVOPACKs SGM7D Motor Drive with built-in INDEXER

Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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
 - Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name		Length (L)	Order Number	Appearance	
0	Analog Monitor Cable		1 m	JZSP-CA01-E		
2	Digital Opera Cable	ator Converter	0.3 m	JZSP-CVS05-A3-E*1		
3	Computer Ca	able	2.5 m	JZSP-CVS06-02-E		
		Soldered Conn		JZSP-CSI9-1-E		
		- I MAILD CADIOL	0.5 m	JUSP-TA50PG-E		
	I/O Signal Cables		1 m	JUSP-TA50PG-1-E	<u> </u>	
4			2 m	JUSP-TA50PG-2-E		
			1 m	JZSP-CSI01-1-E		
		at One End (loose wires	2 m .IZSP-CSI01-2-F # *>			
		on peripheral device end)	3 m	JZSP-CSI01-3-E		
		Cables with	1 m	JZSP-CVH03-01-E	L L	
(5)	Safety Function	Connectors*2	3 m	JZSP-CVH03-03-E	=·••••••••••••••••••••••••••••••••••••	
	Device Cables	Connector Kit*	3	Contact Tyco Electronics Japan G.K. Product name: Industrial Mini I/O D-shape Type 1 Plug Connector Kit Model number: 2013595-1		

^{*1.} This Converter Cable is required to use the Σ-III-series Digital Operator (JUSP-OP05A) for Σ-7-series SERVO-PACKs.

^{*2.} When using safety functions, connect this Cable to the safety function devices.

When not using safety functions, connect the enclosed Safety Jumper Connector (JZSP-CVH05-E) to the SER-VOPACK.

^{*3.} Use the Connector Kit when you make cables yourself.

МЕМО

Σ-7W Two-axis MECHATROLINK-III Communications Reference SERVOPACKs

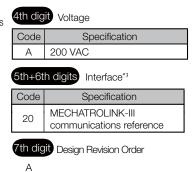
Model Designations

SGD7W -

1R6

Σ-7 Series Σ-7W SERVOPACKs

1st+2nd+3rd digits Maximum Applicable Motor Capacity per Ax					
Voltage	Code	Specification			
Three-	1R6*1	0.2 kW			
phase,	2R8*1	0.4 kW			
200 VAC	5R5*1*2	0.75 kW			
VAC	7R6	1.0 kW			



8th+9th+10th digits Specification						
Code	Specification	Applicable Models				
None	Without options					
000	without options	All models				
001	Rack-mounted	All models				
002	Varnished					
020*4	No dynamic brake	SGD7W-1R6A to -2R8A				
020	External dynamic brake resistor	SGD7W-5R5A to -7R6A				
700*5	HWBB option	All models				

11th+12th+13th digits FT/EX Specification								
Code	Specification							
None 000	None							

(Available in Japan						
	Code	Specification				
	None	None				
	В	BTO Specification				

BTO Specification*

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. If you use the Servomotor with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below. If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65%. ((90% + 40%)/2 = 65%)
- *3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *4. Refer to the following manual for details.
 - $\ \ \, \square$ Σ -7-Series AC Servo Drive Σ -7S/ Σ -7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *5. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual (Manual No.: SIEP S800001 72)
- *6. The BTO specification indicates if the SERVOPACK is customized by using the MechatroCloud BTO service. You need a BTO number to order SERVOPACKs with customized specifications. Refer to page M-15 for the details on the BTO service.

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

	Model SGD7W-		1R6A	2R8A	5R5A	7R6A
Maximum App	licable Motor Capacity p	er Axis [kW]	0.2	0.4	0.75	1.0
Continuous Ou	ıtput Current per Axis [A	rms]	1.6	2.8	5.5	7.6
Instantaneous N	/laximum Output Current p	oer Axis [Arms]	5.9	9.3	16.9	17.0
Main Circuit	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Maii Circuit	Input Current [Arms]*		2.5	4.7	7.8	11
Control	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Control	Input Current [Arms]*		0.25	0.25	0.25	0.25
Power Supply	Capacity [kVA]*		1.0	1.9	3.2	4.5
	Main Circuit Power Loss [W]		24.0	43.3	78.9	94.2
	Control Circuit Power Loss [W]		17	17	17	17
Power Loss*	Built-in Regenerative F Power Loss [W]	8	8	16	16	
	Total Power Loss [W]		49	68	112	16 127
	Built-In Regenerative Resistor	Resistance $[\Omega]$	40	40	12	12
Regenerative Resistor		Capacity [W]	40	40	60	60
	Minimum Allowable External Resistance [Ω]		40	40	12	12
Overvoltage Ca	ategory			ļ	I	

^{*} This is the net value at the rated load.

◆ Single-phase, 200 VAC

	Model SGD7W-		1R6A	2R8A	5R5A*1
Maximum Appl	icable Motor Capacity p	er Axis [kW]	0.2	0.4	0.75
Continuous Ou	tput Current per Axis [A	rms]	1.6	2.8	5.5
Instantaneous M	laximum Output Current p	er Axis [Arms]	5.9	9.3	16.9
Main Circuit	Power Supply		200 VAC to 240	VAC, -15% to +10	%, 50 Hz/60 Hz
Main Circuit	Input Current [Arms]*2	2	5.5	11	12
Control	Power Supply		200 VAC to 240	VAC, -15% to +10	%, 50 Hz/60 Hz
Control	Input Current [Arms]*2	2	0.25	0.25	0.25
Power Supply Capacity [kVA]*2			1.3	2.4	2.7
	Main Circuit Power Loss [W]		24.1	43.6	54.1
	Control Circuit Power	Loss [W]	17	17	17
Power Loss*2	Built-in Regenerative Power Loss [W]	Resistor	8	8	16
	Total Power Loss [W]		49	69	87
	Built-In Regenerative Resistor	Resistance $[\Omega]$	40	40	12
Regenerative Resistor		Capacity [W]	40	40	60
	Minimum Allowable External Resistance [Ω]		40	40	12
Overvoltage Ca	ategory			III	

^{*1.} If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.

If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).

^{*2.} This is the net value at the rated load. However, a load ratio of 65% was used for the SGD7W-5R5A.

◆ 270 VDC

	Model SGD7W-	1R6A	2R8A	5R5A	7R6A
Maximum A	Applicable Motor Capacity [kW]	0.2	0.4	0.75	1.0
Continuous	Output Current [Arms]	1.6	2.8	5.5	7.6
Instantaneo	ous Maximum Output Current [Arms]	5.9	9.3	16.9	17.0
Main Circuit	Power Supply	270	VDC to 324 VI	DC, -15% to +	-10%
Mail Ollouit	Input Current [Arms]*	3.0	5.8	9.7	14
Control	Power Supply 270 VDC to 324 VDC, -15% to +10%				
Control	Input Current [Arms]*	0.25	0.25	0.25	0.25
Power Sup	ply Capacity [kVA]*	1.2	2	3.2	4.6
Devices	Main Circuit Power Loss [W]	18.7	33.3	58.4	73.7
Power Loss*	Control Circuit Power Loss [W]	17	17	17	17
LU33.	Total Power Loss [W]	36	50	75	91
Overvoltage	e Category		I		

^{*} This is the net value at the rated load.

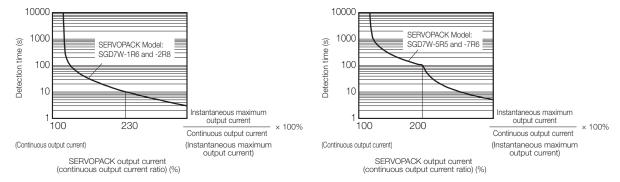
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

Specifications

	Item	Specification
Со	ntrol Method	IGBT-based PWM control, sine wave current drive
ack	With Rotary Servomotor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)
Feedback	With Linear Servomotor	 Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.)
	Surrounding Air Temperature	-5°C to 55°C With derating, usage is possible between 55°C and 60°C. Refer to the following section for derating specifications. **Derating Specifications** (page 417)
	Storage Temperature	-20°C to 85°C
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)
US	Storage Humidity	95% relative humidity max. (with no freezing or condensation)
iii Iii	Vibration Resistance	4.9 m/s ²
onc	Shock Resistance	19.6 m/s ²
<u>м</u>	Degree of Protection	IP20
Environmental Conditions	Pollution Degree	Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust.
Ш	Altitude	1,000 m or less. With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for derating specifications. **Derating Specifications** (page 417)
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity
Ар	plicable Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, and EN 61800-5-1
Mc	punting	Base-mounted or rack-mounted
	Speed Control Range	1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)
9		±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)
Jan	Coefficient of Speed	0% of rated speed max. (for a voltage fluctuation of ±10%)
Performance	Fluctuation*	±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)
<u> </u>	Torque Control Precision (Repeatability)	±1%
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)

			Item	Specification	
	Ove	erhe	at Protection Input	Number of input points: 2 Input voltage range: 0 V to +5 V	
	als			Allowable voltage range: 24 VDC ±20% Number of input points: 12	
	Sequence Input Signals		ut Signals That Can Be ocated	Input method: Sink inputs or source inputs Input Signals P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals DEC (Origin Return Deceleration Switch) signal EXT1 to /EXT3 (External Latch Input 1 to 3) signals FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed	
I/O Signals		Fixe	ed Output	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 2 Output signal: Servo Alarm (ALM)	
2	ignals			Allowable voltage range: 5 VDC to 30 VDC Number of output points: 5 (A photocoupler output (isolated) is used.)	
	Sequence Output Signals	Output Signals That Can Be Allocated		Output Signals • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /BK (Brake) signal • /WARN (Warning) signal • /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.	
	č	2	Interfaces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)	
٠,	22A	3)	1:N Communications	Up to N = 15 stations possible for RS-422A port	
nmunications	RS-422A	1:N Communications Axis Address Settings		03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.	
J L	č	2	Interface	Personal computer (with SigmaWin+)	
Com	USB	(CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).	
Dis	splay		dicators	CHARGE, PWR, CN, L1, and L2 indicators, and two, one-digit seven-segment displays	
MECHATROLINK-III	ons		mmunications Protocol ation Address Settings	MECHATROLINK-III 03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.	
	icat	Ext	ended Address Setting	Axis 1: 00 hex, Axis 2: 01 hex	
4TR	unu		ud Rate	100 Mbps	
IECHATROLINK- Communications		Tra	nsmission Cycle	250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms)	
ME	Ŏ	Nui Byt	mber of Transmission es	32 or 48 bytes/station A DIP switch (S3) is used to select the baud rate.	
ce	ס	Per	formance	Position, speed, or torque control with MECHATROLINK-III communications	
Reference	Method	Ref	ference Input	MECHATROLINK-III commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)	
ď	_	Pro	ofile	MECHATROLINK-III standard servo profile	
ME			DLINK-III	Rotary switch (S1 and S2) positions: 16	
		Inion	ations Setting Switches	Number of DIP switch (S3) pins: 4	

Item	Specification
Analog Monitor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)
Dynamic Brake (DB)	Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.
Regenerative Processing	Built-in
Overtravel (OT) Prevention	Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal
Protective Functions	Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.
Utility Functions	Gain adjustment, alarm history, jogging, origin search, etc.
Option Module	Option Module cannot be attached.

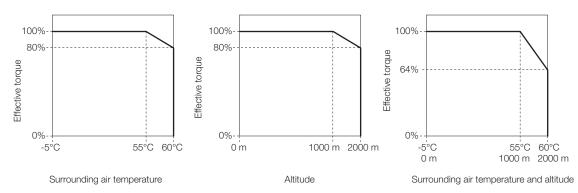
^{*} The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = $\frac{\text{No-load motor speed - Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

Derating Specifications

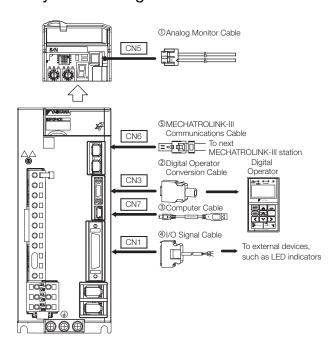
If you use the SERVOPACK at a surrounding air temperature of 55° C to 60° C or at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graphs.

◆ SGD7W-1R6A, -2R8A, -5R5A, and -7R6A



Selecting Cables

System Configurations



◆ Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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
 - \bigcirc Σ -7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name	Length (L)	Order Number	Appearance
1	Analog Monitor Cable	1 m	JZSP-CA01-E	
2)	© Digital Operator Converter Cable	0.3 m	JZSP-CVS05-A3-E*1	
		0.0111	JZSP-CVS07-A3-E*2	
3	Computer Cable	2.5 m	JZSP-CVS06-02-E	

Continued from previous page.

			Length		Continued from previous page.
Code	N	ame	(L)	Order Number	Appearance
		Soldered Conn	ector Kit	DP9420007-E	
		Connector-	0.5 m	JUSP-TA36P-E	
		Terminal Block Con-	1 m	JUSP-TA36P-1-E	
4	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA36P-2-E	
		Cable with	1 m	JZSP-CSI03-1-E	
		Loose Wires	2 m	JZSP-CSI03-2-E	
		at One End (loose wires on peripheral device end)	3 m	JZSP-CSI03-3-E	
-		0.2 m	JEPMC-W6012-A2-E		
			0.5 m	JEPMC-W6012-A5-E	
			1 m	JEPMC-W6012-01-E	
			2 m	JEPMC-W6012-02-E	
			3 m	JEPMC-W6012-03-E	
			4 m	JEPMC-W6012-04-E	
			5 m	JEPMC-W6012-05-E	= · • • • • • • • • • • • • • • • • • •
			10 m	JEPMC-W6012-10-E	
			20 m	JEPMC-W6012-20-E	
	MECHATRO		30 m	JEPMC-W6012-30-E	
(5)	LINK-III Communi-		50 m	JEPMC-W6012-50-E	
9	cations	Cables with	10 m	JEPMC-W6013-10-E	
	Cables	Connectors	20 m	JEPMC-W6013-20-E	
		on Both Ends	30 m	JEPMC-W6013-30-E	
		(with core)	50 m	JEPMC-W6013-50-E	
			0.5 m	JEPMC-W6014-A5-E	
			1 m	JEPMC-W6014-01-E	
		Cable with	3 m	JEPMC-W6014-03-E	
		Loose Wires	5 m	JEPMC-W6014-05-E	
		at One End	10 m	JEPMC-W6014-10-E	
			30 m	JEPMC-W6014-30-E	
			50 m	JEPMC-W6014-50-E	

^{*1.} This Converter Cable is required to use the Σ -III-series Digital Operator (JUSP-OP05A) for Σ -7-series SERVO-PACKs.

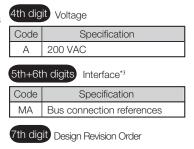
^{*2.} If you use a MECHATROLINK-III Communications Reference SERVOPACK, this Converter Cable is required to prevent the cable from disconnecting from the Digital Operator.

Σ -7C Two-axis Bus Connection Reference SERVOPACKs with built-in Controllers

Model Designations



1st+2nd+3rd digits Maximum Applicable Motor Capacity per Axis					
Code	Specification				
1R6*1	0.2 kW				
2R8*1	0.4 kW				
5R5*1*2	0.75 kW				
7R6	1.0 kW				
	Code 1R6*1 2R8*1 5R5*1*2				



8th+9t	8th+9th+10th digits Specification				
Code	Specification	Applicable Models			
None	Without options				
000	Without options	All models			
001	Rack-mounted	All models			
002	Varnished				
020*4	No dynamic brake	SGD7C-1R6A to -2R8A			
020	External dynamic brake resistor	SGD7C-5R5A to -7R6A			
700*5	HWBB option	All models			

- *1. You can use these models with either a single-phase or three-phase power supply input.
- *2. If you use the Servomotor with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below. If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65%. ((90% + 40%)/2 = 65%)
- *3. The same SERVOPACKs are used for both Rotary Servomotors and Linear Servomotors.
- *4. Refer to the following manual for details.
 - \square Σ -7-Series AC Servo Drive Σ -7S/ Σ -7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual (Manual No.: SIEP S800001 73)
- *5. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual (Manual No.: SIEP S800001 72)

Ratings and Specifications

Ratings

◆ Three-phase, 200 VAC

	Model SGD7C-		1R6A	2R8A	5R5A	7R6A
Maximum App	licable Motor Capacity p	0.2	0.4	0.75	1.0	
Continuous Ou	ıtput Current per Axis [A	.rms]	1.6	2.8	5.5	7.6
Instantaneous N	/laximum Output Current p	oer Axis [Arms]	5.9	9.3	16.9	17.0
Main Circuit	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Mail Circuit	Input Current [Arms]*		2.5	4.7	7.8	11
Control	Power Supply		200 VAC to	240 VAC, -15	% to +10%, 5	0 Hz/60 Hz
Control	Input Current [Arms]*	0.25	0.25	0.25	0.25	
Power Supply Capacity [kVA]*			1.0	1.9	3.2	4.5
	Main Circuit Power Loss [W]		24.0	43.3	78.9	94.2
	Control Circuit Power	17	17	17	17	
Power Loss*	Built-in Regenerative F Power Loss [W]	8	8	16	16	
	Total Power Loss [W]	49	68	112	127	
	Built-In Regenerative Resistor	Resistance $[\Omega]$	40	40	12	12
Regenerative Resistor		Capacity [W]	40	40	60	60
	Minimum Allowable External Resistance $[\Omega]$		40	40	12	12
Overvoltage Ca	ategory			l	II .	

^{*} This is the net value at the rated load.

◆ Single-phase, 200 VAC

	Model SGD7C-		1R6A	2R8A	5R5A*1
Maximum Appli	icable Motor Capacity p	er Axis [kW]	0.2	0.4	0.75
Continuous Ou	tput Current per Axis [A	rms]	1.6	2.8	5.5
Instantaneous M	aximum Output Current p	er Axis [Arms]	5.9	9.3	16.9
Main Circuit	Power Supply		200 VAC to 240	VAC, -15% to +10	%, 50 Hz/60 Hz
Main Circuit	Input Current [Arms]*2	2	5.5	11	12
Control	Power Supply		200 VAC to 240	VAC, -15% to +10	%, 50 Hz/60 Hz
Control	Input Current [Arms]*2	!	0.25	0.25	0.25
Power Supply (Power Supply Capacity [kVA]*2			2.4	2.7
	Main Circuit Power Loss [W]		24.1	43.6	54.1
	Control Circuit Power	Loss [W]	17	17	17
Power Loss*2	Built-in Regenerative Power Loss [W]	Resistor	8	8	16
	Total Power Loss [W]		49	69	87
	Built-In Regenerative Resistor	Resistance $[\Omega]$	40	40	12
Regenerative Resistor		Capacity [W]	40	40	60
	Minimum Allowable External Resistance [Ω]		40	40	12
Overvoltage Ca	tegory			III	

^{*1.} If you use the SGD7C-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.

If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).

^{*2.} This is the net value at the rated load. However, a load ratio of 65% was used for the SGD7W-5R5A.

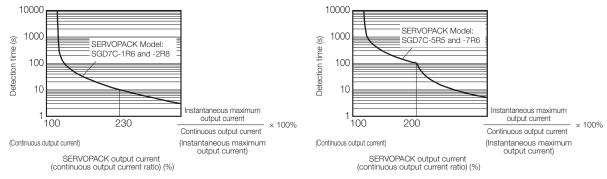
SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of 55°C.

An overload alarm (A.710 or A.720) will occur if overload operation that exceeds the overload protection characteristics shown in the following diagram (i.e., operation on the right side of the applicable line) is performed.

The actual overload detection level will be the detection level of the connected SERVOPACK or Servomotor that has the lower overload protection characteristics.

In most cases, that will be the overload protection characteristics of the Servomotor.



Note: The above overload protection characteristics do not mean that you can perform continuous duty operation with an output of 100% or higher.

For a Yaskawa-specified combination of SERVOPACK and Servomotor, maintain the effective torque (or effective force) within the continuous duty zone of the torque-motor speed characteristic (or force-motor speed characteristics) of the Servomotor.

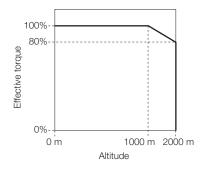
General Specifications

Item		Specification			
Control Meth	nod	IGBT-based PWM control, sine wave current drive			
Feedback	With Rotary Servo- motor	Serial encoder: 17 bits (absolute encoder) 20 bits or 24 bits (incremental encoder/absolute encoder) 22 bits (absolute encoder)			
reedback	With Linear Servo- motor	 Absolute linear encoder (The signal resolution depends on the absolute linear encoder.) Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.) 			
	Surrounding Air Temperature	0°C to 55°C			
	Storage Temperature	-20°C to 85°C			
	Surrounding Air Humidity	10% to 95% relative humidity (with no freezing or condensation)			
	Storage Humidity	10% to 95% relative humidity (with no freezing or condensation)			
	Vibration Resistance	4.9 m/s ²			
	Shock Resistance	19.6 m/s ²			
Environ-	Protection Class	IP20			
mental Conditions	Pollution Degree	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no excessive dust, salts, or iron dust. 			
	Altitude	1,000 m max. Note: With derating, usage is possible between 1,000 m and 2,000 m. Refer to the following section for the derating specifications. **Derating Specifications** (page 424)			
	Power Frequency Magnetic Field	30 A/m (50 Hz/60 Hz), IEC 61000-4-8, Level 4			
	Others	Must be no exposure to electrostatic noise or radiation.			
Applicable S	Standards	UL 61800-5-1 (E147823), CSA C22.2 No.274, EN 55011 group 1 class A, EN 61000-6-2, EN 61000-6-4, EN 61800-3 (Category C2, Second environment), EN 50178, and EN 61800-5-1			
Mounting		Base-mounted or rack-mounted			

Derating Specifications

If you use the SERVOPACK at an altitude of 1,000 m to 2,000 m, you must apply the derating rates given in the following graph.

◆ SGD7C-1R6A, -2R8A, -5R5A, and -7R6A



Servo Section Specifications

Item			Specification	
	Speed Control Range		1:5000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)	
Perfor- mance	Coefficient of Speed Fluctuation*		±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)	
			0% of rated speed max. (for a load fluctuation of 5% to 100%)	
			±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)	
	Torque Control Precision (Repeatability)		±1%	
	Soft Start Time Setting		0 s to 10 s (Can be set separately for acceleration and deceleration.)	
	Overheat Protection Input		Number of input points: 2 Input voltage range (0 V to 5 V)	
			Allowable voltage range: 24 VDC ±20% Number of input points: 12	
	Sequence Input Signals	Input Signals That Can Be Allo- cated	Input method: Sink inputs or source inputs Input Signals: • P-OT (Forward Drive Prohibit Input) and N-OT (Reverse Drive Prohibit Input) signals • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals • /DEC (Origin Return Deceleration Switch) signal • /EXT1 to /EXT3 (External Latch Input 1 to 3) signals • FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed.	
I/O Signals	Sequence Output Signals	Fixed Outputs	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 2 Output signal: ALM (Servo Alarm Output) signal	
		Output Signals That Can Be Allo- cated	Allowable voltage range: 5 VDC to 30 VDC Number of outputs points: 5 (Photocoupler outputs (isolated) are used.) Output (2015)	
			 /COIN (Positioning Completion) signal /V-CMP (Speed Coincidence Detection) signal /TGON (Rotation Detection) signal /S-RDY (Servo Ready) signal /CLT (Torque Limit Detection) signal /VLT (Speed Limit Detection) signal /BK (Brake) signal /WARN (Warning) signal /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed. 	
Communi- cations	USB Communi- cations (CN7)	Interface Communications Standard	Personal computer (with SigmaWin+) Conforms to USB2.0 standard (12 Mbps).	
Displays/Indicators		II.	CHARGE and PWR indicators, and two, one-digit seven-segment displays	
Reference Method			Reference with built-in controller	
Dynamic Brake (DB)			Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.	
Regenerative Processing			Built-in	
Overtravel (OT) Prevention			Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit Input) or N-OT (Reverse Drive Prohibit Input) signal	
Protective Functions			Overcurrent, overvoltage, undervoltage, overload, regeneration error, etc.	
Utility Functions			Gain adjustment, alarm history, jogging, origin search, etc.	
Applicable Option Modules			None	

 $[\]boldsymbol{\ast}$ The coefficient of speed fluctuation for load fluctuation is defined as follows:

Coefficient of speed fluctuation = $\frac{\text{No-load motor speed - Total-load motor speed}}{\text{Rated motor speed}} \times 100\%$

Controller Section Specifications

This section provides the specifications of the Controller Section.

◆ Hardware Specifications

Item	Specification	
Flash Memory	Capacity: 24 MB (15 MB of user memory)	
SDRAM	Capacity: 256 MB	
MRAM	Capacity: 4 MB	
Calendar	Seconds, minutes, hour, day, week, month, year, day of week, and timing	
Ethernet	One port, 10Base-T or 100Base-TX	
MECHATROLINK	MECHATROLINK-III, 1 circuit with 1 port Master	
USB	USB 2.0, Type A host, 1 portCompatible devices: USB storage	
Indicators and Displays	Seven-segment displayStatus indicatorsUSB Status IndicatorEthernet status indicators	
Switches	DIP switches: Mode switches STOP/SAVE switch	
Connectors	MECHATROLINK-III connector (CN6) USB connector (CN10) Ethernet connector (CN12) Controller Section I/O connector (CN13)	

◆ Performance Specifications

	Item	Specification	Remarks	
	SVC4	4 axes	Circuit number selected from 1 to 16.	
Number of Controlled Axes	SVD	1 circuit 2 axes		
	SVD	2 axes 4 axes	Circuit number selected from 1 to 16.	
	SVR4	1 circuit	Circuit number selected from 1 to 16.	
Con	Maximum Number of Controlled Axes	6 axes	-	
Scan Time Settings	H Scan	0.5 ms to 32.0 ms (in 0.25-ms increments)	Refer to the following manual for details. Σ-7-Series Σ-7C SERVOPACK Product Manual (Manual No.: SIEP S800002 04)	
	L Scan	2.0 ms to 300 ms (in 0.5-ms increments)	_	
<u></u>	H Scan Default	4 ms	_	
Sca	L Scan Default	200 ms	_	
	Calendar	Supported.	-	
nera ces	Communications Interface	Ethernet	-	
Peripheral Devices	USB	Supported.	-	
	DRAM	256 MB with ECC	_	
Memory Capacity	MRAM	4 MB	Up to 1 MB can be used to back up table data.	
Men Cap	Program Capacity	15 MB	Total capacity including definition data, ladder programs, table data, etc.	
	Number of Startup Drawings (DWG.A)	64		
Ladder Programs	Number of Interrupt Drawings (DWG.I)	64		
	Number of High-Speed Scan Drawings (DWG.H)	1000	Number of steps per drawing: 4,000	
Ladde	Number of Low-Speed Scan Drawings (DWG.L)	2000		
	Number of User Function Drawings	2000		
	Number of Programs	512	Total of all programs listed below: • Motion main programs • Motion subprograms • Sequence main programs • Sequence subprograms	
	Number of Groups	16	-	
sms	Number of Tasks	32	_	
Motion Programs	Number of Nesting Levels for IF Instructions	8	-	
	Number of Nesting Levels for MSEE Instructions	8	-	
	Number of Parallel Forks Per Task	8	Select from the following four options: • Main: 4 forks, Sub: 2 forks • Main: 8 forks • Main: 2 forks, Sub: 4 forks • Sub: 8 forks	
	Number of Simultaneously	10 axes	_	
	Controlled Axes Per Task		Continued on next page	

Item		Specification	Remarks	
S Registers		64 Kwords	_	
•	M Registers		1 Mword	_
Ø	G Registers		2 Mwords	_
Registers	I/O Registers		64 Kwords	-
g	Motion Registers		32 Kwords	-
	C Registers		16 Kwords	-
	# Registers		16 Kwords	-
	D Registers		16 Kwords	-
-	Bit (B)		Supported.	0 or 1
	Integer (W)		Supported.	-32,768 to 32,767
Ø	Double-Length Integer (L)		Supported.	-2,147,483,648 to 2,147,483,647
Data Types	Quadruple-Length Integer (Q)		Supported.	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
ate	Single-Precision	on Real Number (F)	Supported.	± (1.175E-38 to 3.402E+38) or 0
	Double-Precision Real Number (D)		Supported.	±(2.225E-308 to 1.798E+308) or 0
	Addresses (A))	Supported.	0 to 16,777,214
ters	Subscript i		Supported.	Special registers for offsetting addresses.
egis	Subscript j		Supported.	Subscripts i and j function identically.
Index Registers	Array Register	rs	Supported.	Used to handle registers as arrays.
	Number of Groups		4	-
ing	Trace Memory		256 Kwords total in 4 groups	-
rac	Traceable Data Points		16 points per group	-
Data Tracing	Trigger Types		>, <, =, <>, >=, <= and differential detec- tion of the above con- ditions	_
	Number of Gr	oups	4	_
	Log Storage Location		Built-in RAM disk or USB memory device	_
gging	Log File Formats		CSV file format or binary file format	_
ĵòŢ	Data Logging Points		64 points per group	-
Data Log	Number of Log Files	Built-in RAM Disk	1 to 4,000	_
		USB Memory	1 to 32,767 or unlimited	The ultimate upper limit is 10,000 files even if unlimited is selected.
	Trigger Types		>, <, =, <>, >=, <=	

◆ Communications Function Module Specifications

Item			Specification	Remarks
Abbreviation			218IFD	
		nission Interface	10Base-T/100Base-TX	_
ommo Items	Numbe	er of Communications Ports (Connectors)	1	_
Common Items	Transn	nission Protocols	TCP/UDP/IP/ARP/ICMP/ IGMP	-
	Connections		20 + 2 (I/O message communications)	_
	Maxim Chann	um Number of Communications els	10 + 2 (I/O message communications)	-
		natic Reception	Supported.	Not supported for no- protocol communications.
	Conne		10	-
		atic Reception Status Monitor	Supported.	_
	ations	MEMOBUS	Write: 100 words Read: 125 words	_
	munica	Extended MEMOBUS	Write: 2,043 words Read: 2,044 words	_
	Comr	MELSEC (A-Compatible 1E)	Write: 256 words Read: 256 words	_
	ssage	MELSEC (QnA-Compatible 3E)	Write: 960 words Read: 960 words	_
	of Mes	MODBUS/TCP	Write: 100 words Read: 125 words	-
	Size	OMRON	Write: 996 words Read: 999 words	-
ons	E	TOYOPUC	Write: 1,022 words	_
Ethernet Communications	Maximum Size of Message Communications	No-protocol	Write: 2,046 words	-
Comm		MEMOBUS	Write: 100 words Read: 125 words	_
ernet	age	Extended MEMOBUS	Write: 1,024 words Read: 1,024 words	_
Eth	Message	MELSEC (A-Compatible 1E)	Write: 256 words Read: 256 words	_
	um Size of I/O N Communication	MELSEC (QnA-Compatible 3E)	Write: 256 words Read: 256 words	_
	Size o	MODBUS/TCP	Write: 100 words Read: 125 words	-
	Maximum Size of I/O Communicatio	OMRON	Write: 996 words Read: 999 words	-
	Мах	Execution Conditions	You can select controls (start/stop) from a ladder program.	-
		Execution Status Monitor	Supported.	_
	MotomanSync-MP		Supported.	_
	FTP Server		Supported.	_
	FTP Client		Supported.	-
		re Buffer Mode Selection for No-	Supported.	-
	ing	Communications Platform	Ethernet	_
	gineeri Tools	Controller Searches	Supported.	_
	Engineering Tools	Supported Engineering Tools	MPE720 Ver.7 and SigmaWin+ Ver.7	_

◆ Motion Control Function Module Specifications

Module	Item		Specification
	Numb	er of Controlled Axes*1	2
SVD	Reference Update Cycle (High- Speed Scan Cycle Performed by the CPU)		500 μs to 32.0 ms
	Regist	er Ranges	Registers for two axes are assigned from the registers for each circuit. Refer to the following manual for details. Σ-7-Series Σ-7C SERVOPACK Motion Control User's Manual (Manual No.: SIEP S800002 03)
	Numb	er of Controlled Axes*1	4
	Reference Update Cycle (High- Speed Scan Cycle Performed by the CPU)		500 μs to 32.0 ms
	Register Ranges		Registers for four axes are assigned from the registers for each circuit. Refer to the following manuals for details. Σ-7-Series Σ-7C SERVOPACK Motion Control User's Manual (Manual No.: SIEP S800002 03)
	MECHATROLINK-III communications	Communications Interface	Master
		Communications Cycle (Reference Update Cycle)	500 μs to 32.0 ms
SVC4		Transmission Cycle*2	125 μs, 250 μs, 500 μs, or 1 ms
		Communications Cable	MECHATROLINK-III Communications Cable
		Maximum Number of Connectable Stations	8
		Topology	Cascade connections, star connections, or mixed star-cascade connections
	P.	Terminating Resistance	Not required.
	1ECHAT	Connectable Slave Devices	SERVOPACKs, Stepping Motor Drivers, Inverters, I/O Modules, and Machine Controllers that support MECHATROLINK-III communications
	2	Supported Profiles	MECHATROLINK-III Servo Standard, MECHATROLINK-III I/O Standard, MECHATROLINK-III Inverter Standard, and MECHATROLINK-III Stepping Motor Standard
	Number of Controlled Axes*1		4
SVR4	Reference Update Cycle (High- Speed Scan Cycle Performed by the CPU)		500 μs to 32.0 ms
5VK4	Regist	er Ranges	Registers for four axes are assigned from the registers for each circuit. Refer to the following manuals for details. Σ-7-Series Σ-7C SERVOPACK Motion Control User's Manual (Manual No.: SIEP S800002 03)

^{*1.} A maximum of six axes can be controlled with the Motion Control Function Module in a Σ -7C SERVOPACK. Do not control more than a total of six axes with one Motion Control Function Module.

♦ M-EXECUTOR Specifications

■ Registerable Programs

Program Ty	ре	Number of Registered Programs
Motion Programs		32*
	Startup	1
Coguando Drograma	Interrupt	Not possible.
Sequence Programs	H scan	32*
	L scan	32*

^{*} The combined total of motion programs and sequence programs must not exceed 32.

^{*2.} The transmission cycle is the cycle in which the SVC4 and the slave devices perform communications on the MECHATROLINIK-III transmission path.

■ Program Control Methods

You can use the following control methods for the programs that are registered in the M-EXECUTOR:

Item	Motion Pro	grams	Sequer	nce Programs
Execution Method	Sequential execution		Startup: Even H scan: Scan L scan: Scan	execution
	The same number inumber. Definition No.	s used for the d		r and system work
System Work	No.1	1	TTATTIBOT	
Cystem Work	No.2	2		
	:	:		
	No.32	32		
Program Designation Method	Direct designation of ignation	or indirect des-	Direct designa	ation
Program Execution Method	Register the program in the definitions and start execution by turning ON the start signal.			tarted when the pro- ered in the defini-
Interpolation Override Setting	Supported.		Not supported	. k
I/O Link Definitions	Supported.		Not supported	d.
Motion Program Status Reporting in S Registers	Supported.			
Number of Parallel Forks	Up to 8 Main: 4 forks, Sub: 2 forks Main: 8 forks Main: 2 forks, Sub:4 forks Sub: 8 forks		No forks	
Error Diagram Execution When an Operation Error Occurs	Supported.			

◆ USB Memory Specifications

Item	Specification	Remarks
Supported Media	USB memory	Refer to the following section for details.
	device	■ Recommended USB Memory Device (page 431)
Applicable FAT	FAT16/32	_
Maximum Number of Nested Directories	10	_
		Uses the calendar in the Controller Section.
File Information	Last update time-	Refer to the following manual for details.
The information	stamp supported.	Σ-7-Series Σ-7C SERVOPACK Product Manual (Manual No.: SIEP S800002 04)
Maximum Length for File Name and Directory Names	256 characters	_
Current Directory Function	16	-
Maximum Number of Simulta- neously Open Files	16	_
Formatting	Not supported.	Use a formatted USB memory device.

■ Recommended USB Memory Device

The following USB memory device is recommended. It can be purchased from Yaskawa.

Model	Specification	Manufacturer	
SFU24096D1BP1TO-C-QT-111-CAP	4-GB USB memory	Swissbit Japan Inc.	

◆ IO16 Function Module Specifications

The following table gives the specifications of the IO16 Function Module. There are 16 digital inputs and 16 digital outputs in the IO16 Function Module.

Item		Specification		
	Number of Inputs	16		
	Input Method	Sink/source		
	Isolation Method	Photocouplers		
	Input Voltage	24 VDC ±20%		
	Input Current	5 mA (typical)		
Digital Inputs	ON Voltage/Current	15 V min./2 mA min.		
Digital inputo	OFF Voltage/Current	5 V max./1 mA max.		
	ON/OFF Time	0.01 ms + Digital filter setting		
	Digital Filter Setting	0 to 65,535 µs		
	Number of Commons	2 (8 points per common)		
	Others	DI_00 is also used for interrupt signals.		
	Otricio	DI_01 is also used as the pulse latch input.		
	Number of Outputs	16		
	Output Method	Transistor open-collector sink outputs		
	Isolation Method	Photocouplers		
	Output Voltage	24 VDC (20 V to 30 V)		
	Output Current	50 mA max.		
Digital Outputs	Leakage Current When OFF	0.1 mA max.		
	ON/OFF Time	0.01 µs (for output current of 85 mA)		
	Number of Commons	2 (8 points per common)		
	Output Protection	Thermistor (automatic recovery after blow out)		
	Others	DO_00 is also used as the Match Output.		

◆ Counter Specifications

The following table gives the specifications of counter. The counter uses a pulse input on one channel.

Item	Specification				
	Number of Inputs	1 (phase A, B, or Z input)			
	Input Circuits	Phases A and B: 5-V differential input, not isolated, maximum frequency: 4 MHz Phase Z: 5-V, 12-V, or 24-V photocoupler input, maximum frequency: 500 kHz			
	Input Modes Phases A and B, sign, and incrementing/decrement				
Pulse Input	Latch Input	Pulses are latched for phase Z or DI_01. Response Times for Phase-Z Input ON: 1 μs max. OFF: 1 μs max. Response Times for DI_01 Input ON: 60 μs max. OFF: 0.5 ms max.			
	Other Functions	Match detection, counter preset and clear, electronic gear conversion, phase-C (phase-Z), and digital filter			

◆ System Register Specifications

This section shows the overall structure of the system registers.

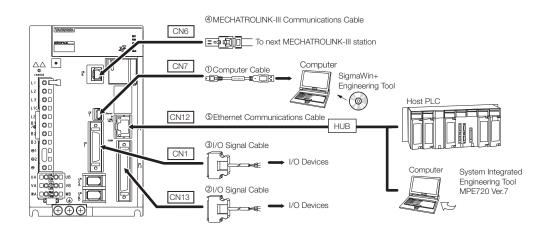
Refer to the following manuals for details.

- $\ \square$ Σ -7-Series Σ -7C SERVOPACK Product Manual (Manual No.: SIEP S800002 04)
- \square Σ -7-Series Σ -7C SERVOPACK Troubleshooting Manual (Manual No.: SIEP S800002 07)

Register Addresses	Contents
SW00000 to SW00029	System Service Registers
SW00030 to SW00049	System Status
SW00050 to SW00079	System Error Status
SW00080 to SW00089	User Operation Error Status
SW00090 to SW00103	System Service Execution Status
SW00104 to SW00109	Reserved.
SW00110 to SW00189	Detailed User Operation Error Status
SW00190 to SW00199	Reserved.
SW00200 to SW00503	System I/O Error Status
SW00504 and SW00505	Reserved.
SW00506 and SW00507	Security Status
SW00508 to SW00649	Reserved.
SW00650 to SW00667	USB-Related System Status
SW00668 to SW00693	Reserved.
SW00694 to SW00697	Message Relaying Status
SW00698 to SW00789	Interrupt Status
SW00790 to SW00799	Reserved.
SW00800 to SW01095	Module Information
SW01096 to SW02687	Reserved.
SW02688 to SW03199	PROFINET Controller (266IF-01) IOPS Status
SW03200 to SW05119	Motion Program Information
SW05120 to SW05247	Used by the system (system memory read).
SW05248 to SW08191	Reserved.
SW08192 to SW09215	Expansion Motion Program Information
SW09216 to SW09559	Reserved.
SW09560 to SW10627	Expansion System I/O Error Status
SW10628 to SW13699	Reserved.
SW13700 to SW14259	Expanded Unit and Module Information
SW14260 to SW15997	Reserved.
SW15998 to SW16011	Expansion System Service Execution Status
SW16012 to SW16199	Reserved.
SW16200 to SW17999	Alarm History Information
SW18000 to SW19999	Reserved.
SW20000 to SW22063	Product Information
SW22064 to SW23999	Reserved.
SW24000 to SW24321	Data Logging Execution Status
SW24322 to SW24999	Reserved.
SW24400 to SW24719	FTP Client Status and Controls
SW25000 to SW25671	Automatic Reception Status for Ethernet Communications
SW25672 to SW27599	Reserved.
SW27600 to SW29775	Maintenance Monitor
SW29776 to SW65534	Reserved.

Selecting Cables

System Configurations



◆ Selection Table



- 1. Use the cable specified by Yaskawa for the Computer Cable. Operation may not be dependable with any other cable.
- 2. Use the cable specified by Yaskawa for the MECHATROLINK Communications Cables. Operation may not be dependable due to low noise resistance with any other cable.

Note: 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
- Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

Code	Name		Length (L)	Order Number	Appearance
①	Computer Cable		2.5 m	JZSP-CVS06-02-E	
		Soldered Conn	ector Kit	DP9420007-E	
		- (With Cania)	0.5 m	JUSP-TA36P-E	
			1 m	JUSP-TA36P-1-E	
2	I/O Signal Cables		2 m	JUSP-TA36P-2-E	
			1 m	JZSP-CSI03-1-E	
			2 m	JZSP-CSI03-2-E	L L
			3 m	JZSP-CSI03-3-E	

Continued on next page.

Continued from previous page.

Code	N	ame	Length (L)	Order Number	Appearance	
		Soldered Connector K		JZSP-CSI9-1-E		
		Connector-	0.5 m	JUSP-TA50PG-E		
		Terminal Block Con-	1 m	JUSP-TA50PG-1-E		
3	I/O Signal Cables	verter Unit (with cable)	2 m	JUSP-TA50PG-2-E		
		Cable with Loose Wires	1 m	JZSP-CSI01-1-E		
		at One End (loose wires	2 m	JZSP-CSI01-2-E		
		on peripheral device end)	3 m	JZSP-CSI01-3-E		
			0.2 m	JEPMC-W6012-A2-E		
			0.5 m	JEPMC-W6012-A5-E		
			1 m	JEPMC-W6012-01-E		
			2 m	JEPMC-W6012-02-E		
			3 m	JEPMC-W6012-03-E		
			4 m	JEPMC-W6012-04-E		
			5 m	JEPMC-W6012-05-E		
			10 m	JEPMC-W6012-10-E		
			20 m	JEPMC-W6012-20-E		
	MECHATRO		30 m	JEPMC-W6012-30-E		
4	LINK-III Communi-		50 m	JEPMC-W6012-50-E		
4)	cations		10 m	JEPMC-W6013-10-E		
	Cables	Connectors	20 m	JEPMC-W6013-20-E	<u> </u>	
		on Both Ends	30 m	JEPMC-W6013-30-E	三•中国	
		(with core)	50 m	JEPMC-W6013-50-E		
			0.5 m	JEPMC-W6014-A5-E		
			1 m	JEPMC-W6014-01-E		
		Cable with	3 m	JEPMC-W6014-03-E	, L	
		Loose Wires	5 m	JEPMC-W6014-05-E	■ ● ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	
		at One End	10 m	JEPMC-W6014-10-E	<u> </u>	
			30 m	JEPMC-W6014-30-E		
			50 m	JEPMC-W6014-50-E		
(5)	Ethernet communications cables			Use a commercially ava conditions: • Ethernet specification • Category 5 or higher • Twisted-pair cable with		

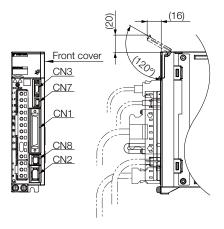
SERVOPACK External Dimensions

Front Cover Dimensions and Connector Specifications

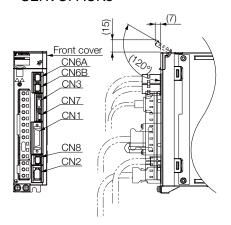
The front cover dimensions and panel connectors depend on the SERVOPACK interface. Refer to the following figures.

Front Cover Dimensions

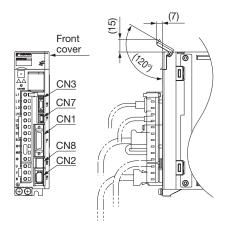
 Σ-7S Analog Voltage/Pulse Train Reference SERVOPACKs



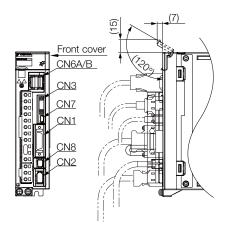
 Σ-7S MECHATROLINK-III Communications Reference SERVOPACKs



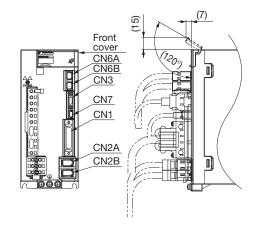
■ Σ-7S Command Option Attachable-Type SERVOPACKs*



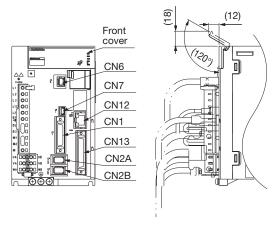
■ Σ-7S MECHATROLINK-II Communications Reference SERVOPACKs



 Σ-7W MECHATROLINK-III Communications Reference SERVOPACKs



■ Σ-7C Bus Connection Reference SERVOPACKs



^{*} A Command Option Module must be attached to the Command Option Attachable-Type SERVOPACK. To find the dimensions of the SERVOPACK with a Command Option Module attached, add the dimensions of the Command Option Module (refer to page 447 and following pages).

Connector Specifications

SERVOPACK	Connector No.	Model	Number of Pins	Manufacturer
	CN1	10250-59A3MB	50	3M Japan Ltd.
Σ-7S Analog Voltage/Pulse Train Reference SERVOPACK	CN2	3E106-0220KV	6	3M Japan Ltd.
	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
	CN7	2172034-1	5	Tyco Electronics Japan G.K.
	CN8	1981080-1	8	Tyco Electronics Japan G.K.
	CN1	10226-59A3MB	26	3M Japan Ltd.
F 70	CN2	3E106-0220KV	6	3M Japan Ltd.
Σ-7S MECHATROLINK-II Communications	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
Reference SERVOPACK	CN6A/B	1903815-1	8	Tyco Electronics Japan G.K.
1.0.0.0.00 02.11 017.01	CN7	2172034-1	5	Tyco Electronics Japan G.K.
	CN8	1981080-1	8	Tyco Electronics Japan G.K.
	CN1	10226-59A3MB	26	3M Japan Ltd.
	CN2	3E106-0220KV	6	3M Japan Ltd.
Σ -7S MECHATROLINK-III	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
Communications Reference SERVOPACK	CN6A, CN6B	1981386-1	8	Tyco Electronics Japan G.K.
	CN7	2172034-1	5	Tyco Electronics Japan G.K.
	CN8	1981080-1	8	Tyco Electronics Japan G.K.
	CN1	10226-59A3MB	26	3M Japan Ltd.
F 70 Command Option	CN2	3E106-0220KV	6	3M Japan Ltd.
Σ-7S Command Option Attachable-Type SERVO- PACK	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
171011	CN7	2172034-1	5	Tyco Electronics Japan G.K.
	CN8	1981080-1	8	Tyco Electronics Japan G.K.
	CN1	10236-59A3MB	36	3M Japan Ltd.
Σ-7W	CN2A, CN2B	3E106-2230KV	6	3M Japan Ltd.
MECHATROLINK-III Communications	CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
Reference SERVOPACK	CN6A, CN6B	1981386-1	8	Tyco Electronics Japan G.K.
	CN7	2172034-1	5	Tyco Electronics Japan G.K.
	CN1	10236-59A3MB	36	3M Japan Ltd.
F-70-D 0 "	CN2A, CN2B	3E106-2230KV	6	3M Japan Ltd.
Σ-7C Bus Connection Reference SERVOPACK	CN6	1981386-1	8	Tyco Electronics Japan G.K.
HOIGIGHUG OLHVOI AUN	CN7	2172034-1	5	Tyco Electronics Japan G.K.
	CN12	26-51024KB13-1	8	UDE Corp.
	CN13	10250-52A3PL	50	3M Japan Ltd.

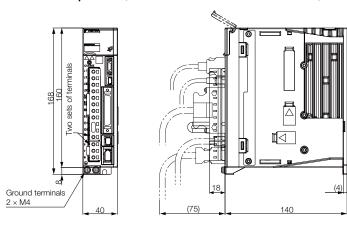
Note: The above connectors or their equivalents are used for the SERVOPACKs.

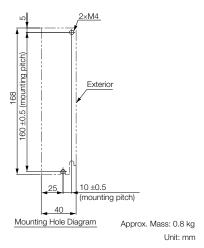
SERVOPACK External Dimensions

Σ -7S SERVOPACKs: Base-mounted

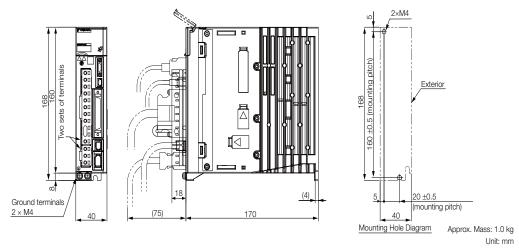
All of the dimensional drawings show Analog Voltage/Pulse Train Reference SERVOPACKs as typical examples.

◆ Three-phase, 200 VAC: SGD7S-R70A, -R90A, and -1R6A

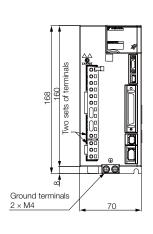


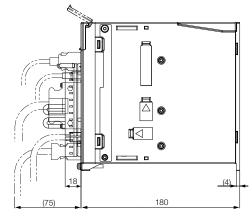


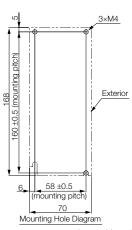
◆ Three-phase, 200 VAC: SGD7S-2R8A Single-phase, 100 VAC: SGD7S-R70F, -R90F, and -2R1F



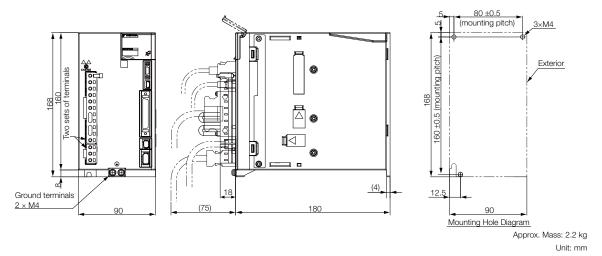
◆ Three-phase, 200 VAC: SGD7S-3R8A, -5R5A, and -7R6A Single-phase, 100 VAC: SGD7S-2R8F



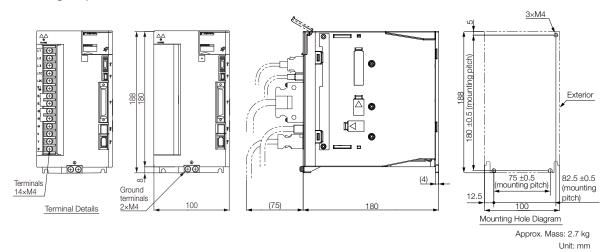




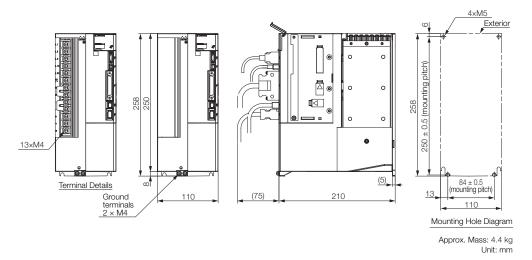
Approx. Mass: 1.6 kg Unit: mm ◆ Three-phase, 200 VAC: SGD7S-120A



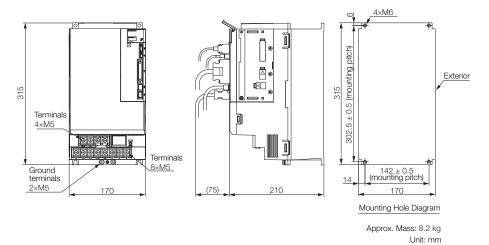
◆ Three-phase, 200 VAC: SGD7S-180A and -200A Single-phase, 200 VAC: SGD7S-120A□□A008



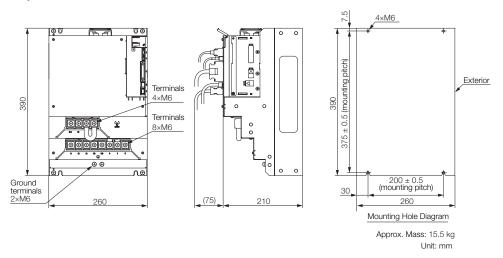
◆ Three-phase, 200 VAC: SGD7S-330A



◆ Three-phase, 200 VAC: SGD7S-470A and -550A



◆ Three-phase, 200 VAC: SGD7S-590A and -780A

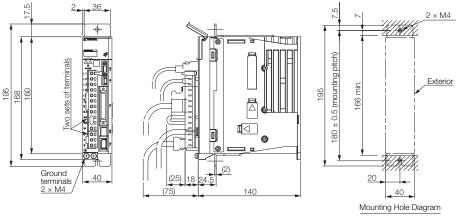


Σ-7S SERVOPACKs: Rack-mounted

Hardware Option Code: 001

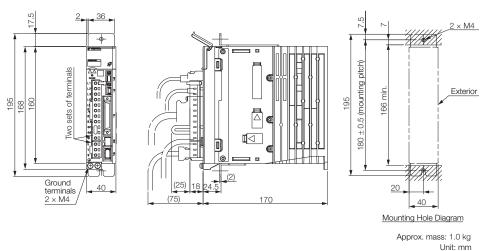
All of the dimensional drawings show Analog Voltage/Pulse Train Reference SERVOPACKs as typical examples.

◆ Three-phase, 200 VAC: SGD7S-R70A, -R90A, and -1R6A

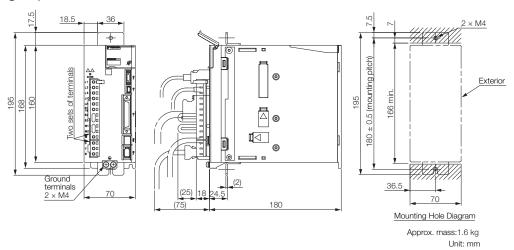


Approx. mass: 0.8 kg Unit: mm

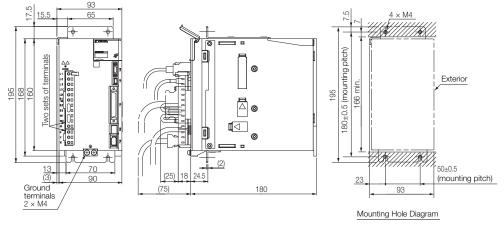
◆ Three-phase, 200 VAC: SGD7S-2R8A Single-phase, 100 VAC: SGD7S-R70F, -R90F, and -2R1F



 Three-phase, 200 VAC: SGD7S-3R8A, -5R5A, and -7R6A Single-phase, 100 VAC: SGD7S-2R8F



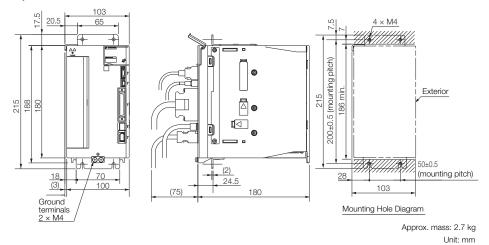
◆ Three-phase, 200 VAC: SGD7S-120A



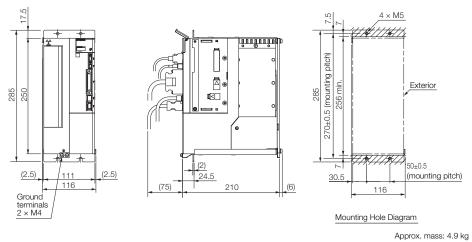
Approx. mass: 2.2 kg Unit: mm

Unit: mm

◆ Three-phase, 200 VAC: SGD7S-180A and -200A



◆ Three-phase, 200 VAC: SGD7S-330A



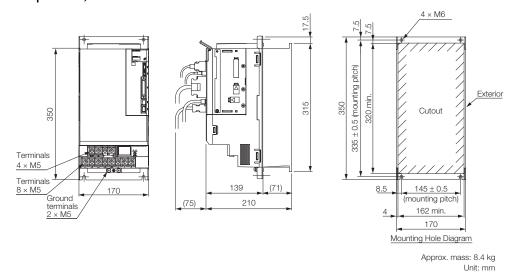
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Σ -7S SERVOPACKs: Duct-ventilated

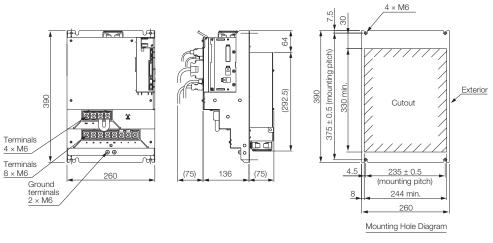
Hardware Option Code: 001

All of the dimensional drawings show Analog Voltage/Pulse Train Reference SERVOPACKs as typical examples.

◆ Three-phase, 200 VAC: SGD7S-470A and -550A



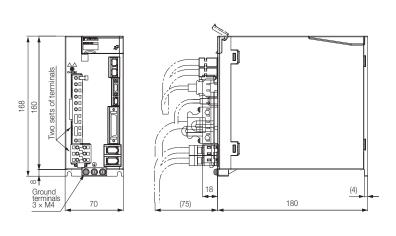
◆ Three-phase, 200 VAC: SGD7S-590A and -780A

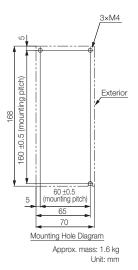


Approx. mass: 13.8 kg Unit: mm

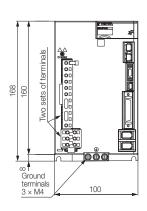
Σ -7W SERVOPACKs: Base-mounted

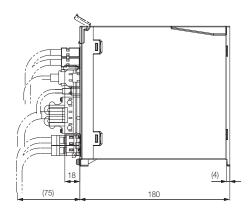
◆ Three-phase, 200 VAC: SGD7W-1R6A and -2R8A

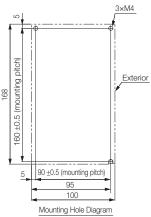




◆ Three-phase, 200 VAC: SGD7W-5R5A and -7R6A



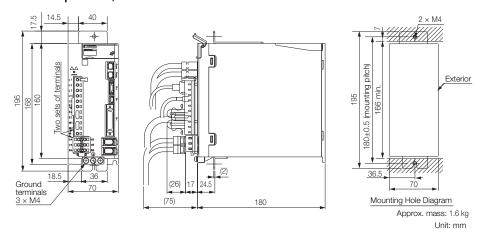




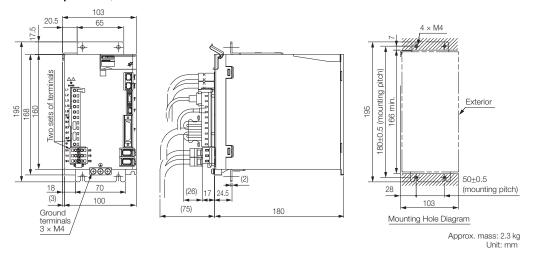
Approx. mass: 2.3 kg Unit: mm

Σ-7W SERVOPACKs: Rack-mounted

◆ Three-phase, 200 VAC: SGD7W-1R6A and -2R8A

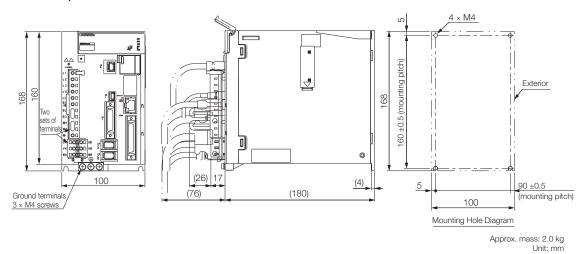


◆ Three-phase, 200 VAC: SGD7W-5R5A and -7R6A

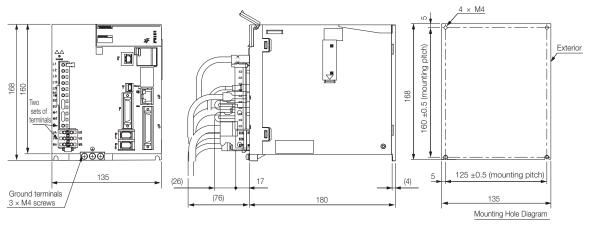


Σ-7C SERVOPACKs: Base-Mounted

◆ Three-phase, 200 VAC: SGD7C-1R6A and -2R8A



◆ Three-phase, 200 VAC: SGD7C-5R5A and -7R6A

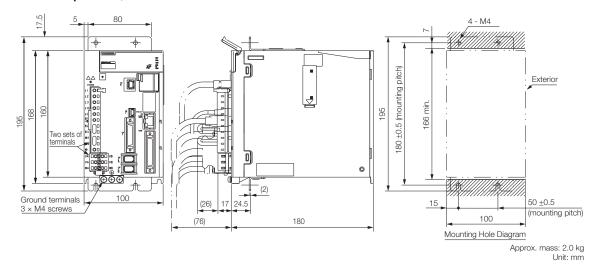


Approx. mass: 2.8 kg Unit: mm

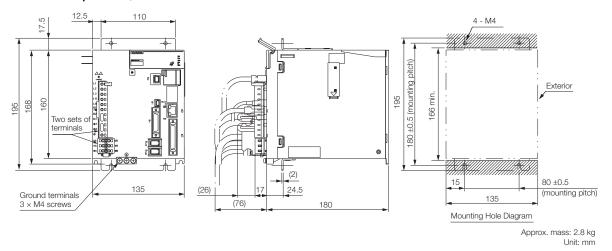
Σ-7C SERVOPACKs: Rack-Mounted

Hardware Option Code: 001

◆ Three-phase, 200 VAC: SGD7C-1R6A and -2R8A

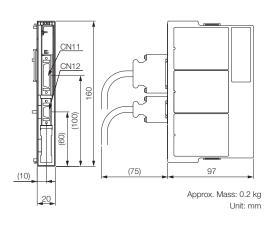


◆ Three-phase, 200 VAC: SGD7C-5R5A and -7R6A

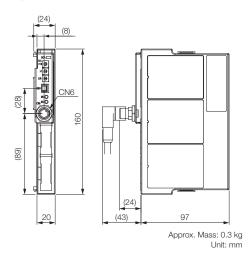


Command Option Module External Dimensions

◆ INDEXER Module

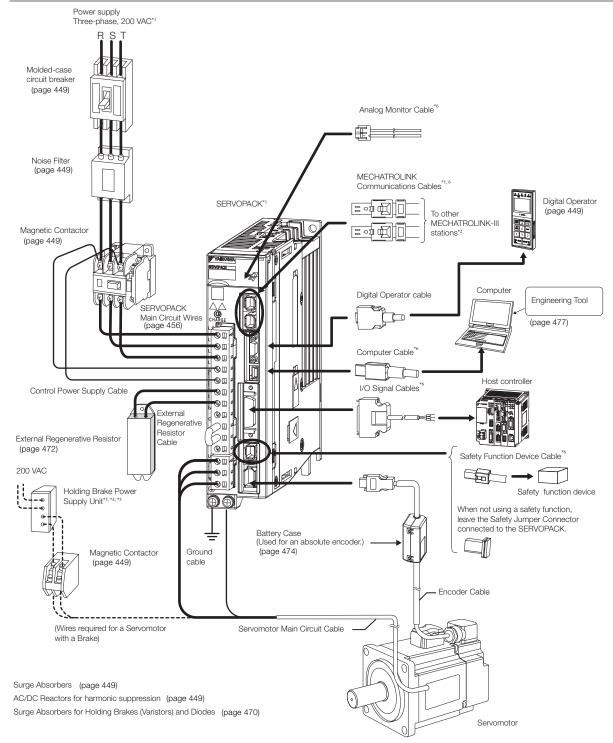


◆ DeviceNet Module



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Peripheral Devices



- *1. The peripheral devices are described using a MECHATROLINK-III Communications Reference, Three-phase 200 VAC SERVOPACK as an example. The shapes of the connectors may be different for other interfaces.
- *2. The connected devices depend on the interface.

 For MECHATROLINK-II communications references: Other MECHATROLINK-II stations

 For analog voltage/pulse train references: There is no CN6 connector.
- *3. A Holding Brake Power Supply Unit is required to use a Servomotor with a Holding Brake. Holding Brake Power Supply Units for 24 VDC are not provided by Yaskawa. Obtain these from other manufacturers. Never connect Holding Brake Power Supply Units with different output voltages to a SERVOPACK. Overcurrent may result in burning in the brake.
- *4. If you use a Servomotor with a Holding Brake, select a brake relay according to the power supply voltage and current of the brake. Yaskawa does not recommend any particular brake relays. Select an appropriate brake relay using the selection method of the brake relay manufacturer.
- *5. The power supply for the holding brake is not provided by Yaskawa. Select a power supply based on the holding brake specifications. If you use a 24-V brake, install a separate power supply for the 24-VDC power supply from other power supplies, such as the one for the I/O signals of the CN1 connector. If the power supply is shared, the I/O signals may malfunction.
- *6. For SERVOPACK cables, refer to the selection table for each type of SERVOPACK.

Peripheral Device Selection Table

◆ Σ-7S SERVOPACKs

Main Circuit Power Supply	Maximum Applicable Motor Capacity [kW]	SERVO- PACK Model: SGD7S-	Noise Filter ^{*1}	AC Reactor*2	DC Reactor*2	Magnetic Contactor	Surge Absorber	Digital Opera- tor
	0.05	R70A						
	0.1	R90A						
	0.2	1R6A	HF3010C-SZC			SC-03		
	0.4	2R8A			X5061			
	0.5	3R8A						
	0.75	5R5A						
Three-	1.0	7R6A	HF3020C-SZC			SC-4-1		JUSP- OP05A- 1-E
phase, 200	1.5	120A	HF3020G-SZG		X5060		LT- C32G801WS	
VAC	2.0	180A			X3000	SC-5-1		
	3.0	200A	HF3030C-SZC		X5059	50-5-1		
	5.0	330A	HF3050C-SZC -47EDD		X5068	SC-N1		
	6.0	470A		_	X008025	30-111		
	7.5	550A	HF3060C-SZC		X008026	SC-N2		
	11	590A	HF3100C-SZC		X008027	SC-N2S		
	15	780A			X008028	SC-N3		
-	0.05	R70A		V50:	X5071	- SC-03		
	0.1	R90A	HF2010A-UPF		73071			
Single-	0.2	1R6A	111 20 10/1 01 1		X5070			
phase, 200	0.4	2R8A			X5069		LT-	
VAC	0.75	5R5A	HF2020A-UPF- 2BB		X5079	SC-4-1		
	1.5	120A□ □□008	HF2030A-UPF- 2BB		X5078	SC-5-1	C12G801WS	
Single-	0.05	R70F		X5053				
phase,	0.1	R90F	HF2010A-UPF	A3033		SC-03		
100	0.2	2R1F		X5054	_			
VAC	0.4	2R8F	HF2020A-UPF	X5056		SC-4-1		

Device	Inquiries		
Noise Filters			
Surge Absorbers	Yaskawa Controls Co., Ltd.		
AC/DC Reactors for harmonic suppression			
Magnetic Contactors	Fuji Electric FA Components & Systems Co., Ltd.		

^{*1.} Some Noise Filters have large leakage currents. The grounding conditions also affect the size of the leakage current. If necessary, select an appropriate leakage detector or leakage breaker taking into account the grounding conditions and the leakage current from the Noise Filter.

Note: 1. Consult the manufacturer for details on peripheral devices.

- 2. For Digital Operator Converter cables, refer to the selection table for each type of SERVOPACK.
- 3. Refer to the following manual for the following information.
 - Dimensional drawings, ratings, and specifications of peripheral devices
 - \square Σ -7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

^{*2.} The last digit of an RoHS-compliant serial number is R. Consult with Yaskawa Controls Co., Ltd. for RoHS-compliant reactors.

♦ Σ-7W SERVOPACKs

Main Circuit Power Supply	Maximum Applicable Motor Capacity per Axis [kW]	SERVO- PACK Model: SGD7W-	Noise Filter*1	AC Reactor*2	DC Reactor*2	Magnetic Contactor	Surge Absorber	Digital Opera- tor
Three-	0.2	1R6A	HF3010C-SZC		X5061	SC-03		
phase,	0.4	2R8A	HF3020C-SZC		73001	SC-4-1	LT-	
200	0.75	5R5A		X5060	30-4-1	C32G801WS	JUSP-	
VAC	1.0	7R6A			SC-5-1			
0:1-	0.2	1R6A	HF2010A-UPF	_	X5069	SC-03		OP05A- 1-E
Single- phase, 200	0.4	2R8A	HF2020A-UPF- 2BB		X5079	SC-4-1	LT- C12G801WS	
VAC	0.75	5R5A	HF2030A-UPF- 2BB		X5078	SC-5-1		

Device	Inquiries				
Noise Filters					
Surge Absorbers	Yaskawa Controls Co., Ltd.				
AC/DC Reactors for harmonic suppression					
Magnetic Contactors	Fuji Electric FA Components & Systems Co., Ltd.				

^{*1.} Some Noise Filters have large leakage currents. The grounding conditions also affect the size of the leakage current. If necessary, select an appropriate leakage detector or leakage breaker taking into account the grounding conditions and the leakage current from the Noise Filter.

Note: 1. Consult the manufacturer for details on peripheral devices.

2. Refer to the following section for information on Digital Operator Converter Cables.

Selection Table (page 418)

- 3. Refer to the following manual for the following information.
- Dimensional drawings, ratings, and specifications of peripheral devices
- Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

^{*2.} The last digit of an RoHS-compliant serial number is R. Consult with Yaskawa Controls Co., Ltd. for RoHS-compliant reactors.

♦ Σ-7C SERVOPACKs

Main Circuit Power Supply	Maximum Appli- cable Motor Capacity per Axis [kW]	SERVO- PACK Model: SGM7C-	Noise Filter ^{*1}	AC Reactor*2	DC Reactor*2	Magnetic Contactor	Surge Absorber
Three-	0.2	1R6A	HF3010C-SZC		X5061	SC-03	
phase, 200	0.4	2R8A			7,0001	SC-4-1	LT-
	0.75	5R5A	HF3020C-SZC		X5060	30-4-1	C32G801WS
VAC	1.0	7R6A				SC-5-1	
Circ sile	0.2	1R6A	HF2010A-UPF	_	X5069	SC-03	
Single- phase, 200	0.4	2R8A	HF2020A-UPF- 2BB		X5079	SC-4-1	LT- C12G801WS
VAC	0.75	5R5A	HF2030A-UPF- 2BB		X5078	SC-5-1	31233011110

Device	Inquiries			
Noise Filters				
Surge Absorbers	Yaskawa Controls Co., Ltd.			
AC/DC Reactors for harmonic suppression				
Magnetic Contactors	Fuji Electric FA Components & Systems Co., Ltd.			

^{*1.} Some Noise Filters have large leakage currents. The grounding conditions also affect the size of the leakage current. If necessary, select an appropriate leakage detector or leakage breaker taking into account the grounding conditions and the leakage current from the Noise Filter.

Note: 1. Consult the manufacturer for details on peripheral devices.

- 2. Refer to the following manual for the following information.
- Dimensional drawings, ratings, and specifications of peripheral devices
 - Σ-7-Series AC Servo Drive Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

^{*2.} The last digit of an RoHS-compliant serial number is R. Consult with Yaskawa Controls Co., Ltd. for RoHS-compliant reactors.

Molded-case Circuit Breakers and Fuses

Using an AC Power Supply

Use a molded-case circuit breaker and fuse to protect the power supply line. They protect the power line by shutting OFF the circuit when overcurrent is detected. Select these devices based on the information in the following tables.

Note: The following tables also provide the net values of the current capacity and inrush current. Select a fuse and a molded-case circuit breaker that meet the following conditions.

- Main circuit and control circuit: No breaking at three times the current value given in the table for 5 s.
- Inrush current: No breaking at the current value given in the table for 20 ms.

♦ Σ-7S SERVOPACKs

	Maximum		Power Supply	Current	Capacity	Inrush	Current	Rated Voltage	
Main Circuit Power Supply	Applicable Motor Capacity [kW]	SERVOPACK Model: SGD7S-	Capacity per SERVOPACK [kVA]*	Main Circuit [Arms]*	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Fuse [V]	MCCB [V]
	0.05	R70A	0.2	0.4					
	0.1	R90A	0.3	0.8					
	0.2	1R6A	0.5	1.3			34		
	0.4	2R8A	1.0	2.5	0.2				
	0.5	3R8A	1.3	3.0	0.2	24			
	0.75	5R5A	1.6	4.1		54			
	1.0	7R6A	2.3	5.7					
Three-phase, 200 VAC	1.5	120A	3.2	7.3					
200 VAO	2.0	180A	4.0	10	0.25				
	3.0	200A	5.9	15	0.23				
	5.0	330A	7.5	25					
	6.0	470A	10.7	29	0.3	68		250	240
	7.5	550A	14.6	37			34		
	11	590A	21.7	54	0.4	114			
	15	780A	29.6	73	0.4	114			
	0.05	R70A	0.2	0.8					
	0.1	R90A	0.3	1.6					
Single-phase,	0.2	1R6A	0.6	2.4	0.2				
200 VAC	0.4	2R8A	1.2	5.0					
	0.75	5R5A	1.9	8.7					
	1.5	120A□□□0 08	4.0	16	0.25	34			
-	0.05	R70F	0.2	1.5					
Single-phase,	0.1	R90F	0.3	2.5	0.38				
100 VAC	0.2	2R1F	0.6	5	0.36				
	0.4	2R8F	1.4	10					

^{*} This is the net value at the rated load.

♦ Σ-7W SERVOPACKs

	Maximum		Power Supply Capacity per SERVOPACK [kVA]*1	Current Capacity		Inrush Current		Rated Voltage	
Main Circuit Power Supply	Applicable Motor Capacity per Axis [kW]	SERVOPACK Model: SGD7W-		Main Circuit [Arms]*1	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Fuse [V]	MCCB [V]
	0.2	1R6A	1.0	2.5	-				
Three-phase,	0.4	2R8A	1.9	4.7					
200 VAC	0.75	5R5A	3.2	7.8					
	1.0	7R6A	4.5	11	0.25	34	34	250	240
0: 1	0.2	1R6A	1.3	5.5					
Single-phase, 200 VAC	0.4	2R8A	2.4	11					
	0.75	5R5A*2	2.7	12					

 $[{]m *1.}$ This is the net value at the rated load.

If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 65%).

♦ Σ-7C SERVOPACKs

	Maximum		Power Supply	Current	Capacity	Inrush Current		Rated Voltage	
Main Circuit Power Supply	Applicable Motor Capacity per Axis [kW]	SERVOPACK Model: SGM7C-	Capacity per SERVOPACK [kVA]*1	Main Circuit [Arms]*1	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Fuse [V]	MCCB [V]
	0.2	1R6A	1.0	2.5	-				
Three-phase,	0.4	2R8A	1.9	4.7					
200 VAC	0.75	5R5A	3.2	7.8					
	1.0	7R6A	4.5	11	0.25	34	34	250	240
0: 1	0.2	1R6A	1.3	5.5					
Single-phase, 200 VAC	0.4	2R8A	2.4	11					
	0.75	5R5A*2	2.7	12					

^{*1.} This is the net value at the rated load.

If the load ratio of the first axis is 90%, use a load ratio of 40% for the second axis so that average load ratio for both axes is 65% ((90% + 40%)/2 = 95%).

^{*2.} If you use the SGD7W-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.

^{*2.} If you use the SGM7C-5R5A with a single-phase 200-VAC power supply input, derate the load ratio to 65%. An example is given below.

Using a DC Power Supply

This section gives the power supply specifications for using a DC power supply input. Use the Fuses given in the following tables to protect the power supply line and SERVOPACK. They protect the power line by shutting OFF the circuit when overcurrent is detected.

Note: The following tables provide the net values of the current capacity and inrush current.

Σ-7S SERVOPACKs

Main		Power Supply	Current	Capacity	Inrush	Current	External	Fuse	
Circuit Power Supply	SERVOPACK Model: SGD7S-	Capacity per SERVOPACK [kVA]*1	Main Circuit [Arms]*1	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Order Number*2	Current Rating [A]	Voltage Rating [Vdc]
	R70A	0.2	0.5						
	R90A	0.3	1.0	0.2			3,5URGJ17/16UL	16	
	1R6A	0.5	1.5	0.2					
	2R8A	1.0	3.0				3,5URGJ17/20UL	20	
	3R8A	1.3	3.8	0.2				40	
	5R5A	1.6	4.9		34		3,5URGJ17/40UL		
	7R6A	2.3	6.9				3,3011G0177400L	40	
	120A			0.2					
270 VDC	120A□□□ 008	3.2	11	0.05		34	0.51100.147/00111	00	400
	180A	4.0	14	0.25			3,5URGJ17/63UL	63	
	200A	5.9	20						
	330A	7.5	34		68*³		3,5URGJ17/100UL	100	
	470A	10.7	36	0.3	(5 Ω		3,5URGJ23/160UL	160	
	550A	14.6	48		external)		3,30110025/1000L	100	
	590A	21.7	68		114*3				
	780A	29.6	92	0.4	(3 Ω external)		3,5URGJ23/200UL	200	

^{*1.} This is the net value at the rated load.

There is a risk of equipment damage. For information on the power ON and OFF sequences, refer to the product manual for the type of references used by your SERVOPACK.

Σ-7W SERVOPACKs

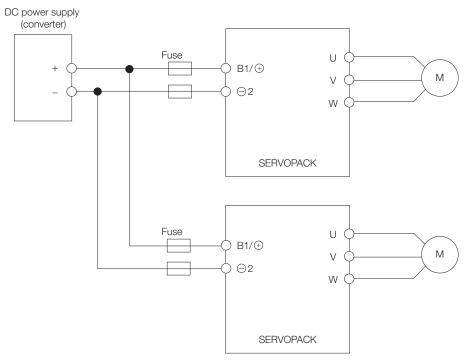
Main		Power Supply	Current Capacity		Inrush Current		External Fuse			
Circuit Power Supply	SERVOPACK Model: SGD7W-	Capacity per SERVOPACK [kVA]*1	Main Circuit [Arms]*1	Control Power Supply [Arms]	Main Circuit [A0-p]	Control Power Supply [A0-p]	Order Number*2	Current Rating [A]	Voltage Rating [Vdc]	
	1R6A	1	3.0				3,5URGJ17/40UL	40		
270	2R8A	1.9	5.8	0.25	34	34	3,301100177400L	40	400	
VDC	5R5A	3.2	9.7	0.23	04	04	3,5URGJ17/63UL	63	400	
	7R6A	4.5	14				0,001100177000L	00		

^{*1.} This is the net value at the rated load.

^{*2.} These Fuses are manufactured by MERSEN Japan.

^{*3.} If you use a DC power supply input with any of the following SERVOPACKs, externally connect an inrush current limiting circuit and use the power ON and OFF sequences recommended by Yaskawa: SGD7S-330A, -470A, -550A, -590A, or -780A.

^{*2.} These Fuses are manufactured by MERSEN Japan.



Note: If you connect more than one SERVOPACK to the same DC power supply, connect Fuses for each SERVO-PACK.

SERVOPACK Main Circuit Wires

This section describes the main circuit wires for SERVOPACKs.



These specifications are based on IEC/EN 61800-5-1, UL 61800-5-1, and CSA C22.2 No.274.

- 1. To comply with UL standards, use UL-compliant wires.
- 2. Use copper wires with a rated temperature of 75° or higher.
- 3. Use copper wires with a rated withstand voltage of 300 V or higher.

Note: To use 600-V heat-resistant polyvinyl chloride-insulated wire (HIV), use the following table as reference for the applicable wires.

- The specified wire sizes are for three bundled leads when the rated current is applied with a surrounding air temperature of 40°C.
- Select the wires according to the surrounding air temperature.

Three-phase, 200-VAC Wires for Σ -7S SERVOPACKs

SERVOPACK Model: SGD7S-	Terminals	Wire Size	Screw Size	Tightening Torque [N·m]	
	Main Circuit Power Supply Cable	L1, L2, L3			
	Servomotor Main Circuit Cable*	U, V, W	ANNO10 (1 05 mm²)		
R70A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3			
	Servomotor Main Circuit Cable*	U, V, W	A) A) (A) (A) (B) (B) (B) (B) (B) (B) (B) (B) (B) (B		
R90A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3			
	Servomotor Main Circuit Cable*	U, V, W	2		
1R6A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3			
	Servomotor Main Circuit Cable*	U, V, W	A) A) (A) (A) (B) (B) (B) (B) (B) (B) (B) (B) (B) (B		
2R8A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3			
	Servomotor Main Circuit Cable*	U, V, W	A) A) (A) (A) (B) (B) (B) (B) (B) (B) (B) (B) (B) (B		
3R8A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3			
	Servomotor Main Circuit Cable*	U, V, W	NNO10 (1.05 %)		
5R5A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

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SERVOPACK Model: SGD7S-	Terminals		Wire Size	Screw Size	Tightening Torque [N·m]
	Main Circuit Power Supply Cable	L1, L2, L3			
	Servomotor Main Circuit Cable*	U, V, W	AWG16 (1.25 mm ²)	_	_
7R6A	Control Power Supply Cable	L1C, L2C	7,000 (1.20 11111)		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W L1C, L2C	, ,	_	_
120A	Control Power Supply Cable External Regenerative Resistor Cable		AWG16 (1.25 mm ²)		
	Ground cable	B1/⊕, B2	AVA/C14 (2.0 mm²) min	M4	1.2 to 1.4
		⊕ L1, L2, L3	AWG14 (2.0 mm²) min.	1014	1.2 10 1.4
	Main Circuit Power Supply Cable		AWG14 (2.0 mm ²)		
180A	Servomotor Main Circuit Cable*	U, V, W	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	A)A(O,1,4,(O,0,-2)	N 4 4	10+-11
	Ground cable	(AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG12 (3.5 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
200A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable	(1)	AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable Servomotor Main Circuit Cable*	L1, L2, L3	AWG8 (8.0 mm ²)		1.0 to 1.2
0004	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	M4	
330A	External Regenerative Resistor Cable		, ,		
	Ground cable	B1/⊕, B2	AWG14 (2.0 mm²)	M4	1.2 to 1.4
			AWG14 (2.0 mm²) min.	1014	1.2 10 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG8 (8.0 mm²)		
4704	Servomotor Main Circuit Cable*	U, V, W	AWG6 (14 mm ²)		
470A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M5	2.2 to 2.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG8 (8.0 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W	AWG4 (22 mm ²)		
550A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG10 (5.5 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.		
	Main Circuit Power Supply Cable	L1, L2, L3	AWG4 (22 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W	AVVO4 (22 IIIII)		
590A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG10 (5.5 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M6	2.7 to 3.0
	Main Circuit Power Supply Cable	L1, L2, L3	AWG3 (30 mm ²)	IVIO	2.7 10 0.0
	Servomotor Main Circuit Cable*	U, V, W			
780A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG8 (8.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.		
		<u></u>			

 $[\]boldsymbol{*}$ If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Single-phase, 200-VAC Wires for Σ -7S SERVOPACKs

SERVOPACK Model: SGD7S-	Terminals		Wire Size	Screw Size	Tightening Torque [N·m]	
	Main Circuit Power Supply Cable	L1, L2				
	Servomotor Main Circuit Cable*	U, V, W	A) A) (A) (A) (B) (
R70A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2				
•	Servomotor Main Circuit Cable*	U, V, W	A) A			
R90A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3				
1R6A	Servomotor Main Circuit Cable*	U, V, W	A) A			
	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3		_		
	Servomotor Main Circuit Cable*	U, V, W	A) A			
2R8A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		_	
•	External Regenerative Resistor Cable	B1/⊕, B2				
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)			
•	Servomotor Main Circuit Cable*	U, V, W				
5R5A	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_	
	External Regenerative Resistor Cable	B1/⊕, B2				
•	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4	
	Main Circuit Power Supply Cables	L1, L2	A)A(O14 (O O mama2)			
	Servomotor Main Circuit Cables*	U, V, W	AWG14 (2.0 mm ²)		101-10	
120A□□□008	Control Power Supply Cables	L1C, L2C	AVAICAG (4.05	M4	1.0 to 1.2	
•	External Regenerative Resistor Cables	B1/⊕, B2	AWG16 (1.25 mm ²)			
	Ground cable		AWG14 (2.0 mm ²) min.		1.2 to 1.4	

^{*} If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Single-phase, 100-VAC Wires for Σ -7S SERVOPACKs

SERVOPACK Model: SGD7S-	Terminals	Wire Size	Screw Size	Tightening Torque [N·m]	
	Main Circuit Power Supply Cable	L1, L2			
	Servomotor Main Circuit Cable*	U, V, W	AWG16 (1.25 mm ²)	_	_
R70F	Control Power Supply Cable	L1C, L2C	AVVG10 (1.23 IIIII)		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2			
	Servomotor Main Circuit Cable*	U, V, W	A) A	-	_
R90F	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)		
_	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2			
	Servomotor Main Circuit Cable*	U, V, W	A)A(Od O (d OF2)		
2R1F	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2	AWG14 (2.0 mm ²)		
	Servomotor Main Circuit Cable*	U, V, W			
2R8F	Control Power Supply Cable	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

^{*} If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

DC Power Supply Wires for Σ -7S SERVOPACKs

SERVOPACK Model: SGD7S-	Terminals*1		Wire Size	Screw Size	Tightening Torque [N·m]
	Servomotor Main Circuit Cables	U, V, W*2	AWG16 (1.25 mm ²)	_	_
D704	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
R70A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	_	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG16 (1.25 mm ²)	_	_
DOOA	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
R90A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG16 (1.25 mm ²)	_	_
4004	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
1R6A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	_	_
	Ground Cable		AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG14 (2.0 mm²) min. AWG14 (2.0 mm²) min. AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG16 (1.25 mm ²)	-	_
0004	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
2R8A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	_	_
	Ground Cable	(\frac{1}{2})	AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	/⊕, ⊝2 AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. V, W*² AWG16 (1.25 mm²) C, L2C AWG16 (1.25 mm²) /⊕, ⊝2 AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. V, W*² AWG16 (1.25 mm²)	_	_
	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
3R8A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	_	_
	Ground Cable		AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG16 (1.25 mm ²)	_	_
EDE A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
5R5A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG16 (1.25 mm ²)	_	_
7004	Control Power Supply Cables	L1C, L2C	A, W*2 AWG16 (1.25 mm²) A, W616 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. A, W*2 AWG16 (1.25 mm²)	-	_
7R6A	Main Circuit Power Supply Cables	U, V, W*2 AWG16 (1.25 mm²2 L1C, L2C AWG16 (1.25 mm²2 della (1.25 mm²2 del	AWG16 (1.25 mm ²)	_	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG14 (2.0 mm ²)	-	_
120A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
(three-phase, 200-VAC input)	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG14 (2.0 mm ²)	-	_
	Ground Cable		AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG14 (2.0 mm ²)	M4	1.0 to 1.2
120A□□□008	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M4	1.0 to 1.2
(single-phase, 200-VAC input)	Main Circuit Power Supply Cables	B1/ _⊕ , ⊝2	AWG14 (2.0 mm ²)	M4	1.0 to 1.2
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W*2	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
1004	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M4	1.0 to 1.2
180A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
	Ground Cable	es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2 L1C, L2C les B1/⊕, ⊝2 Es U, V, W*2	AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

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SERVOPACK Model: SGD7S-	Terminals*1		Wire Size	Screw Size	Tightening Torque [N·m]
0004	Servomotor Main Circuit Cables	U, V, W*2	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M4	1.0 to 1.2
200A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG10 (5.5 mm ²)	M4	1.0 to 1.2
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W	AWG8 (8.0 mm ²)	M4	1.0 to 1.2
330A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M4	1.0 to 1.2
330A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG8 (8.0 mm ²)	M4	1.0 to 1.2
	Ground Cable		Wire Size S J*2 AWG10 (5.5 mm²) M 2C AWG16 (1.25 mm²) M ⊕2 AWG10 (5.5 mm²) M AWG14 (2.0 mm²) min. M AWG8 (8.0 mm²) M QC AWG16 (1.25 mm²) M AWG14 (2.0 mm²) min. M AWG16 (1.25 mm²) M QC AWG16 (1.25 mm²) M AWG14 (2.0 mm²) min. M AWG4 (22 mm²) M QC AWG16 (1.25 mm²) M AWG14 (2.0 mm²) min. M AWG14 (2.0 mm²) min. M AWG4 (22 mm²) M QC AWG16 (1.25 mm²) M QC AWG3 (30 mm²) M AWG3 (30 mm²) M AWG3 (30 mm²) M QC AWG16 (1.25 mm²) M AWG3 (30 mm²) M AWG3 (30 mm²) M QC AWG16 (1.25 mm²) M AWG3 (30 mm²) M	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	U, V, W	Wire Size Size N*2 AWG10 (5.5 mm²) M L2C AWG16 (1.25 mm²) M L2C AWG10 (5.5 mm²) M AWG14 (2.0 mm²) min. M W AWG8 (8.0 mm²) M L2C AWG16 (1.25 mm²) M AWG14 (2.0 mm²) min. M AWG6 (14 mm²) M L2C AWG8 (8.0 mm²) M L2C AWG8 (8.0 mm²) M AWG14 (2.0 mm²) min. M AWG16 (1.25 mm²) M	M5	2.2 to 2.4
4704	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M5	2.2 to 2.4
470A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG8 (8.0 mm ²)	M5	2.2 to 2.4
	Ground Cable		AWG14 (2.0 mm ²) min.	M5	2.2 to 2.4
	Servomotor Main Circuit Cables	U, V, W	AWG4 (22 mm ²)	M5	2.2 to 2.4
550A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M5	2.2 to 2.4
550A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG6 (14 mm ²)	M5	2.2 to 2.4
	Ground Cable		AWG10 (5.5 mm²) AWG10 (5.5 mm²) AWG10 (5.5 mm²) AWG14 (2.0 mm²) min. AWG8 (8.0 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG8 (8.0 mm²) AWG14 (2.0 mm²) min. AWG6 (14 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG4 (22 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG4 (22 mm²) AWG14 (2.0 mm²) min. AWG4 (22 mm²) AWG14 (2.0 mm²) min. AWG4 (22 mm²) AWG16 (1.25 mm²)	M5	2.2 to 2.4
	Servomotor Main Circuit Cables	U, V, W	AWG4 (22 mm ²)	M6	2.7 to 3.0
590A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M6	2.7 to 3.0
590A	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG3 (30 mm ²)	M6	2.7 to 3.0
	Ground Cable	L1C, L2C AWG16 (1.25 mm²) B1/⊕, ⊝2 AWG10 (5.5 mm²) W, V, W AWG8 (8.0 mm²) B1/⊕, ⊝2 AWG16 (1.25 mm²) B1/⊕, ⊝2 AWG8 (8.0 mm²) AWG14 (2.0 mm²) min. U, V, W AWG8 (8.0 mm²) B1/⊕, ⊝2 AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. U, V, W AWG6 (14 mm²) L1C, L2C AWG16 (1.25 mm²) B1/⊕, ⊝2 AWG8 (8.0 mm²) AWG14 (2.0 mm²) min. U, V, W AWG4 (22 mm²) L1C, L2C AWG16 (1.25 mm²) B1/⊕, ⊝2 AWG6 (14 mm²) W, V, W AWG4 (22 mm²) AWG14 (2.0 mm²) min. U, V, W AWG4 (22 mm²) AWG14 (2.0 mm²) min. U, V, W AWG4 (22 mm²) L1C, L2C AWG16 (1.25 mm²) B1/⊕, ⊝2 AWG3 (30 mm²) B1/⊕, ⊝2 AWG3 (30 mm²) L1C, L2C AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. U, V, W AWG3 (30 mm²) AWG16 (1.25 mm²)	M6	2.7 to 3.0	
	Servomotor Main Circuit Cables	U, V, W	AWG3 (30 mm ²)	M6	2.7 to 3.0
780A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	M6	2.7 to 3.0
/ 8UA	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG3 (30 mm ²)	M6	2.7 to 3.0
	Ground Cable		AWG14 (2.0 mm ²) min.	M6	2.7 to 3.0

^{*1.} Do not wire the following terminals: L1, L2, L3, B2, B3, \ominus 1, and \ominus terminals.

^{*2.} If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Three-phase, 200-VAC Wires for Σ -7W SERVOPACKs

SERVOPACK Model: SGD7W-	Terminals		Wire Size	Screw Size	Tightening Torque [N·m]
	Main Circuit Power Supply Cable	L1, L2, L3			
1R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
2R8A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm²)	_	-
	Control Power Supply Cable	L1C, L2C	7.0.010 (1.20 11111)		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
5R5A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	-
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		L2, L3 VA, UB, WB , L2C ⊕, B2 AWG14 (2.0 mm²) min. L2, L3 AWG14 (2.0 mm²) VA, UB, WB , L2C ⊕, B2 AWG14 (2.0 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. L2, L3 AWG14 (2.0 mm²) VA, UB, WB , L2C ⊕, B2 AWG14 (2.0 mm²) VA, UB, WB , L2C ⊕, B2 AWG14 (2.0 mm²) VA, UB, WB , L2C ⊕, B2 AWG14 (2.0 mm²) AWG16 (1.25 mm²) VA, UB, WB , L2C AWG14 (2.0 mm²) AWG14 (2.0 mm²) VA, UB, WB AWG16 (1.25 mm²) AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
7R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

^{*} If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Single-phase, 200-VAC Wires for Σ -7W SERVOPACKs

SERVOPACK Model: SGD7W-	Terminals		Wire Size	Screw Size	Tightening Torque [N·m]
	Main Circuit Power Supply Cable	L1, L2, L3			
1R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
111071	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG14 (2.0 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) AWG14 (2.0 mm²) AWG14 (2.0 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)	_	
2R8A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)		_
	Control Power Supply Cable	L1C, L2C	7,0000 (1.20 11)		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG14 (2.0 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) AWG14 (2.0 mm²) AWG14 (2.0 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG14 (2.0 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG14 (2.0 mm²) AWG14 (2.0 mm²)		
5R5A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	_	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

^{*} If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

DC Power Supply Wires for Σ -7W SERVOPACKs

SERVOPACK Model: SGD7W-	Terminal* ¹		Wire Size	Screw Size	Tightening Torque [N·m]
	Servomotor Main Circuit Cables	UA, VA, WA, UB, VB, WB*2	AWG16 (1.25 mm ²)	-	_
1R6A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	_	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
2R8A	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	UA, VA, WA, UB, VB, WB*2	AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG16 (1.25 mm²) C AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG16 (1.25 mm²)	-	_
2R8A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG16 (1.25 mm ²)	-	_
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	UA, VA, WA, UB, VB, WB*2	AWG16 (1.25 mm ²)	_	_
5R5A	Control Power Supply Cables	L1C, L2C	Wire Size AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG16 (1.25 mm²)	-	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG14 (2.0 mm ²)	-	_
	Ground Cable		Wire Size S A, JB, VB*2 L2C AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. A, JB, VB*2 L2C AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. A, JB, VB*2 AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. A, JB, VB*2 L2C AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Servomotor Main Circuit Cables	UA, VA, WA, UB, VB, WB ^{*2}	AWG16 (1.25 mm²)		_
7R6A	Control Power Supply Cables	L1C, L2C	AWG16 (1.25 mm ²)	-	_
	Main Circuit Power Supply Cables	B1/⊕, ⊝2	AWG14 (2.0mm ²)	-	-
	Ground Cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

^{*1.} Do not wire the following terminals: L1, L2, L3, B2, B3, \ominus 1, and \ominus terminals.

^{*2.} If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Three-phase, 200-VAC Wires for Σ -7C SERVOPACKs

SERVOPACK Model: SGM7C-	Terminals		Wire Size	Screw Size	Tightening Torque [N·m]
	Main Circuit Power Supply Cable	L1, L2, L3		_	
1R6A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm²)		_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2			
Model: SGM7C- Main Circuit Power Supply Cable L1, L2, L3 Servomotor Main Circuit Cable* UA, VA, WA, UB, VB, WB Control Power Supply Cable L1C, L2C External Regenerative Resistor Cable B1/⊕, B2 Ground cable	AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4		
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
200	Servomotor Main Circuit Cable*	WA, UB,	AWG16 (1.25 mm ²)	-	_
	Control Power Supply Cable	L1C, L2C	7,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)	_	_
5R5A	Servomotor Main Circuit Cable*	WA, UB,	AWG16 (1.25 mm ²)		
	Control Power Supply Cable	L1C, L2C	B2 AWG14 (2.0 mm²) min. A, L3 AWG14 (2.0 mm²) A, B, B 2C B2 AWG16 (1.25 mm²) A, C AWG14 (2.0 mm²) min. A, L3 AWG14 (2.0 mm²) A, B, B B AWG16 (1.25 mm²) A, B, B AWG16 (1.25 mm²) A, B, B AWG16 (1.25 mm²)		
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG16 (1.25 mm²) AWG14 (2.0 mm²) min. AWG14 (2.0 mm²) AWG14 (2.0 mm²) AWG14 (2.0 mm²) min. AWG14 (2.0 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG16 (1.25 mm²) AWG14 (2.0 mm²) AWG14 (2.0 mm²) AWG14 (2.0 mm²) AWG14 (2.0 mm²) AWG16 (1.25 mm²)	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
7R6A	Servomotor Main Circuit Cable*	WA, UB,	AWG16 (1.25 mm²)	_	_
		L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

 $[\]boldsymbol{*}$ If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Single-phase, 200-VAC Wires for Σ -7C SERVOPACKs

SERVOPACK Model: SGM7C-	Terminals		Wire Size	Screw Size	Tightening Torque [N·m]
1R6A	Main Circuit Power Supply Cable	L1, L2, L3			_
	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)	 -	_
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)	_	
2R8A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm ²)		-
	Control Power Supply Cable	L1C, L2C	,		
	External Regenerative Resistor Cable	B1/⊕, B2			
	Ground cable	Cable B1/⊕, B2	M4	1.2 to 1.4	
	Main Circuit Power Supply Cable	L1, L2, L3	AWG14 (2.0 mm ²)		
5R5A	Servomotor Main Circuit Cable*	UA, VA, WA, UB, VB, WB	AWG16 (1.25 mm²)	-	-
	Control Power Supply Cable	L1C, L2C			
	External Regenerative Resistor Cable	B1/⊕, B2	AWG14 (2.0 mm ²)		
	Ground cable		AWG14 (2.0 mm ²) min.	M4	1.2 to 1.4

^{*} If you do not use the recommended Servomotor Main Circuit Cable, use this table to select wires.

Wire Types

The following table shows the wire sizes and allowable currents for three bundled leads.

HIV Specificat	Allowable Current at Surrounding Air Temperatures [Arms]			
Nominal Cross-sectional Area [mm²]	Configuration [Wires/mm]	30°C	40°C	50°C
0.9	7/0.4	15	13	11
1.25	7/0.45	16	14	12
2.0	7/0.6	23	20	17
3.5	7/0.8	32	28	24
5.5	7/1.0	42	37	31
8.0	7/1.2	52	46	39
14.0	7/1.6	75	67	56
22.0	7/2.0	98	87	73
38.0	7/2.6	138	122	103

^{*} This is reference data based on JIS C3317 600-V-grade heat-resistant polyvinyl chloride-insulated wires (HIV).

Crimp Terminals and Insulating Sleeves

If you use crimp terminals for wiring, use insulating sleeves. Do not allow the crimp terminals to come close to adjacent terminals or the case.

To comply with UL standards, you must use UL-compliant closed-loop crimp terminals and insulating sleeves for the main circuit terminals. Use the tool recommended by the crimp terminal manufacturer to attach the crimp terminals.

The following tables give the recommended tightening torques, closed-loop crimp terminals, and insulating sleeves in sets. Use the set that is suitable for your model and wire size.

Σ -7S SERVOPACKs with Three-Phase, 200-VAC and DC Power Supply

SERVOPACK Model: SGD7S-	Main Circuit	Screw Size	Tightening Torque	Crimp Terminal Horizontal	Recom- mended Wire	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model (Tokyo Dip
Wodel. Gdb7G	Terminals	OIZC	[N·m]	Width	Size	(From J.	(From J.S.T. Mfg. Co., Ltd.)		
R70A, R90A,	Connector					_			
1R6A, 2R8A, 3R8A, 5R5A, 7R6A, or 120A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_
	+				AWG10 (5.5 mm ²)	5.5-S4		-	TP-005
1004 or 2004	Termi- nal block	M4	1.0 to 1.2	7.7 mm max.	AWG14 (2.0 mm ²)	O M4	YHT- 2210	-	TD 000
180A or 200A	DIOCK				AWG16 (1.25 mm ²)	2-M4		_	TP-003
		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_
					AWG8 (8.0 mm ²)	8-4NS	YPT- 60N	TD-121 TD-111	TP-008
0004	Termi- nal block	M4	1.0 to 1.2	9.9 mm max.	AWG14 (2.0 mm ²)	D0 4	YHT-	_	TD 000
330A					AWG16 (1.25 mm ²)	R2-4	2210	_	TP-003
		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_
					AWG4 (22 mm ²)	22-S5		TD-123 TD-112	TP-022
					AWG6 (14 mm ²)	R14-5	YPT- 60N	TD-122 TD-111	TP-014
	Termi- nal	M5	2.2 to	13 mm	AWG8 (8.0 mm ²)	R8-5		TD-121 TD-111	TP-008
470A or 550A	block	IVIO	2.4	max.	AWG10 (5.5 mm ²)	R5.5-5		_	TP-005
					AWG14 (2.0 mm ²)	R2-5	YHT- 2210	-	TD 002
					AWG16 (1.25 mm ²)	NZ-0		-	TP-003
		M5	2.2 to 2.4	12 mm max.	AWG14 (2.0 mm ²)	R2-5	YHT- 2210	_	_

Continued on next page.

Continued from previous page.

SERVOPACK Model: SGD7S-	Circuit		Screw Size Tightening Torque		Recom- mended Wire	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
Wodel. SGD13-	Terminals	3126	[N·m]		Size	(From J.	(From J.S.T. Mfg. Co., Ltd.)		
					AWG3 (30 mm ²)	38-S6		TD-124 TD-112	TP-038
	Termi- nal 590A or 780A block				AWG4 (22 mm ²)	R22-6	YPT- 60N	TD-123 TD-112	TP-022
		M6	2.7 to	18 mm	AWG8 (8.0 mm ²)	R8-6	TD-121 TD-111	TP-008	
590A or 780A		IVIO	3.0	max.	AWG10 (5.5 mm ²)	R5.5-6	R5.5-6	_	TP-005
					AWG14 (2.0 mm ²)	(2.0 mm ²) 2210		-	TP-003
					AWG16 (1.25 mm ²)	R2-6		_	11 -000
		M6	2.7 to 3.0	12 mm max.	AWG14 (2.0 mm ²)	R2-6	YHT- 2210	_	_

Σ -7S SERVOPACKs with Single-Phase, 200-VAC Power Supply

SERVOPACK Model: SGD7S-	Main Circuit	Screw Size	Tightening Torque	Crimp Terminal Horizontal	Recom- mended Wire	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
Model: SGD7S-	Terminals	Oize	[N·m]	Width	Size	(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
R70A, R90A,	Connector					_			
1R6A, 2R8A, or 5R5A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_
	Terminal	M4	1.0 to	7.7 mm	AWG14 (2.0 mm ²)	2-M4	YHT-	-	TP-003
120A□□□008	block	1014	1.2	max.	AWG16 (1.25 mm ²)	2-1014	2210	-	11 -003
		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_

Σ -7S SERVOPACKs with Single-Phase, 100-VAC Power Supply

SERVOPACK Model: SGD7S-	Main Circuit	Circuit Screw	Torque Horizo	Crimp Terminal Horizontal	Recom- mended Wire	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
	Terminals			Width	Size	(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
R70F, R90F,	Connector					_			_
2R1F, or 2R8F		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	_

Σ -7W SERVOPACKs with Three-Phase, 200-VAC and DC Power Supply

SERVOPACK Model: SGD7W-	Main Circuit	Screw Size	Tightening Torque [N·m]	Crimp Terminal Horizontal Width	Recom- mended Wire	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
	Terminals	Terminals 3126			Size	(From J.S.T. Mfg. Co., Ltd.)		(Tokyo Dip Co., Ltd.)	
1064 0004	Connector					_			
1R6A, 2R8A, 5R5A, or 7R6A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	ı	I

Σ-7W SERVOPACKs with Single-Phase, 200-VAC Power Supply

SERVOPACK Model: SGD7W-	Main Circuit	Screw Size	Tightening Torque [N·m]	Crimp Terminal Horizontal Width	Recom- mended Wire Size	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
	Terminals	minals				(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
1R6A, 2R8A, or	Connector					_			_
5R5A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210		_

$\Sigma\text{-7C}$ SERVOPACKs with Three-Phase, 200-VAC and DC Power Supply

SERVOPACK Model: SGM7C-	Main Circuit	Screw Size	Tightening Torque [N·m] Crimp Terminal Horizontal Width	Terminal	Recom- mended Wire Size	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
	Terminals	Terminals 312e				(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
1R6A, 2R8A,	Connector					_			
5R5A, or 7R6A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	_	-

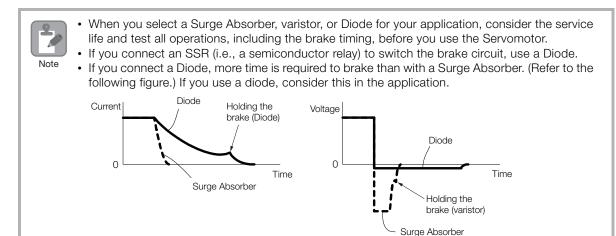
Σ -7C SERVOPACKs with Single-Phase, 200-VAC Power Supply

SERVOPACK Model: SGM7C-	Main Circuit	Screw Size	Tightening Terminal Horizontal Width	Terminal	Recom- mended Wire Size	Crimp Terminal Model	Crimping Tool	Die	Insulating Sleeve Model
	Terminals	erminals 312e				(From J.S.T. Mfg. Co., Ltd.)			(Tokyo Dip Co., Ltd.)
1R6A, 2R8A, or	Connector					_			
5R5A		M4	1.2 to 1.4	10 mm max.	AWG14 (2.0 mm ²)	R2-4	YHT- 2210	-	-

Surge Absorbers (Varistors) and Diodes for Holding Brake Power Supplies

Surge Absorbers (varistors) and Diodes for holding brake power supplies help prevent damage to brake coils caused by voltage surges.

If you use a Servomotor with a Holding Brake and switch the brake power supply circuit on the DC side, connect a Surge Absorber (varistor) or Diode that is suitable for the brake power supply voltage and current.



◆ Surge Absorbers (Varistors) for Holding Brake Power Supplies

Use the following table as reference in selecting a Surge Absorber. Elements were selected for a Surge Absorber surrounding air temperature range of -20°C to 60°C and an ON/OFF switching frequency of 10 times or less per minute. The information in this table is for reference only, and does not ensure operation in combination with the holding brake.

Holding Brake Powe Voltage	er Supply	24 VDC				
Manufacturer		Nippon Chemi-Con Corporation	Semitec Corporation			
Manufacturer		Order Number				
	1 A max.	TNR5V121K	Z5D121			
Brake Rated Current	2 A max.	TNR7V121K	Z7D121			
Diane Hated Guilett	4 A max.	TNR10V121K	Z10D121			
	8 A max.	TNR14V121K	Z15D121			

Diodes for Holding Brake Power Supplies

Select a Diode for the holding brake power supply with a rated current that is greater than that of the holding brake and with the recommended withstand voltage given in the following table. Diodes are not provided by Yaskawa.

Holding Brake Power Su	Withstand Voltage
Rated Output Voltage	Willistand Voltage
24 VDC	100 V to 200 V

Regenerative Resistors

Types of Regenerative Resistors

The following regenerative resistors can be used.

- Built-in regenerative resistors: Some models of SERVOPACKs have regenerative resistors built into them.
- External regenerative resistors: These resistors are used when the smoothing capacitor and builtin regenerative resistor in the SERVOPACK cannot consume all of the regenerative power.
 Use Yaskawa's SigmaSize+, an AC Servo drive capacity selection program, to determine if a regenerative resistor is required.

Note: If you use an External Regenerative Resistor, you must change the setting of the Pn600 (Regenerative Resistor Capacity) or Pn603 (Regenerative Resistance) parameters.

Selection Table

SEF	RVOPACK N	/lodel	Built-In Regener-	External Regener-	Contents
SGD7S-	SGD7W-	SGD7C-	ative Resistor	ative Resistor	Contents
R70A, R90A, 1R6A, 2R8A, R70F, R90F, 2R1F, 2R8F	-	-	None	Basically not required	There is no built-in regenerative resistor, but normally an external regenerative resistor is not required. Install an external regenerative resistor when the smoothing capacitor in the SERVOPACK cannot process all the regenerative power.*1
3R8A, 5R5A, 7R6A, 120A, 180A, 200A, 330A	1R6A, 2R8A, 5R5A, 7R6A	1R6A, 2R8A, 5R5A, 7R6A	Standard fea- ture*2	Basically not required	A built-in regenerative resistor is provided as a standard feature. Install an external regenerative resistor when the built-in regenerative resistor cannot process all the regenerative power.*1
470A, 550A, 590A, 780A	_	_	None	Required.*3	A built-in regenerative resistor is not provided. An External Regenerative Resistor is required. If the External Regenerative Resistor is not connected to the SERVOPACK, a Regeneration Alarm (A.300) will occur.

^{*1.} Use Yaskawa's SigmaSize+, an AC Servo drive capacity selection program, to select an external regenerative resistor.

^{*2.} Refer to the following section for the specifications of built-in regenerative resistors.

Built-In Regenerative Resistor (page 472)

^{*3.} Regenerative Resistor Units are available. Refer to the following sections for details.

Regenerative Resistor Units (page 473)

Built-In Regenerative Resistor

The following table gives the specifications of the built-in regenerative resistors in the SERVOPACKs and the amount of regenerative power (average values) that they can process.

SERV	/OPACK Model		Built-In Reg Resis		Regenerative Power Processing Capacity of	Minimum Allowable	
SGD7S-	SGD7W-	SGD7C-	Resistance Capacity [Ω] [W]		Built-In Regenerative Resistor [W]	Resistance $[\Omega]$	
R70A, R90A, 1R6A, 2R8A, R70F, R90F, 2R1F, 2R8F	_	-	_	_	-	40	
3R8A, 5R5A, 7R6A	1R6A, 2R8A	1R6A, 2R8A	40	40	8	40	
120A	_	_	20	60	10	20	
120A□□□008, 180A, 200A	5R5A, 7R6A	5R5A, 7R6A	12	60	16	12	
330A	_	_	8	180	36	8	
470A	-	_	(6.25)*1	(880)*1	(180)*1	5.8	
550A, 590A, 780A	_	_	(3.13)*2	(1760)*2	(350)*2	2.9	

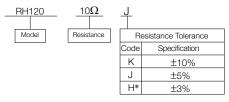
^{*1.} Values in parentheses are for the optional JUSP-RA04-E Regenerative Resistor Unit.

External Regenerative Resistors

Model	Specification	Mass	Wire Size	Manufacturer	Inquiries
RH120	70 W, 1 Ω to 100 Ω	282 g	AWG16 (1.25 mm ²)		
RH150	90 W, 1 Ω to 100 Ω	412 g	AWG16 (1.25 mm ²)		
RH220	120 W, 1 Ω to 100 Ω	500 g	AWG16 (1.25 mm ²)		
RH220B	120 W, 1 Ω to 100 Ω	495 g	AWG14 (2.0 mm ²)	Iwaki Musen Kenkyusho	Yaskawa Controls
RH300C	200 W, 1 Ω to 10 kΩ	850 g	AWG14 (2.0 mm ²)	Co., Ltd.	Co., Ltd.
RH450	150 W, 1 Ω to 100 Ω	880 g	AWG14 (2.0 mm ²)		
RH450FY	150 W, 2 Ω to 100 Ω	1.3 kg	AWG14 (2.0 mm ²)		
RH500	300 W, 2 Ω to 50 Ω	1.4 kg	AWG14 (2.0 mm ²)		

Note: 1. Consult Yaskawa Controls Co., Ltd. if you require a RoHS-compliant resistor.

2. Consult Yaskawa Controls Co., Ltd. for the model numbers and specifications of resistors with Thermal Protector.



^{*} There is no RH450FY model that has a resistance tolerance of H (±3%).

^{*2.} Values in parentheses are for the optional JUSP-RA05-E Regenerative Resistor Unit.

Regenerative Resistor Units

SERVOPACK Model: SGD7S-	Regenerative Resistor Unit Model	Specifications	Allowable Power Loss
470A	JUSP-RA04-E	6.25 Ω, 880 W	180 W
550A, 590A, or 780A	JUSP-RA05-E	3.13 Ω, 1,760 W	350 W

Note: If you use only the above Regenerative Resistor Units, you do not need to change the setting of the Pn600 (Regenerative Resistor Capacity) or Pn603 (Regenerative Resistance) parameters.

◆ External Dimensions

■ JUSP-RA04-E ■ JUSP-RA05-E 4×M5 Protective Protective cover cover 335 External (1.6) External Ground terminals 4×M5 Ground terminal terminal 2×4×M5 (M4 screw) (M4 screw) Cement resistor Cement resistor Unit: mm Unit: mm

Batteries for Servomotors with Absolute Encoders

If you use an absolute encoder, you can use an Encoder Cable with a Battery Case connected to it to supply power and retain the absolute position data.

You can also retain the absolute position data by supplying power from a battery on the host controller.

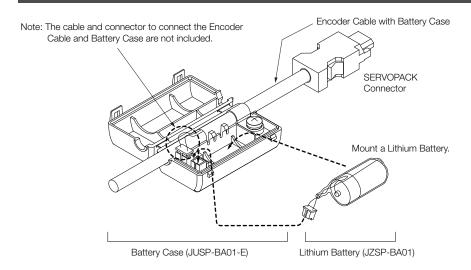
Note: A Battery Case is not required if you use a Servomotor with a Batteryless Absolute Encoder and connect a battery to the host controller.

Using Encoder Cables with Battery Cases

A Battery Case is attached to an Encoder Cable with a Battery Case. To replace the battery, obtain a Lithium Battery (JZSP-BA01) and mount it in the Battery Case.



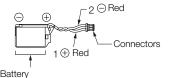
- 1. You cannot attach the Battery Case to an Incremental Encoder Cable.
- 2. Install the Battery Case where the surrounding air temperature is between -5°C and 60°C.



Selection Table

Name Order Number		Remarks		
Battery Case (case only)	JUSP-BA01-E	The Encoder Cable and Battery are not included. (This is a replacement part for a damaged Battery Case.)		
Lithium Battery	JZSP-BA01	This is a special battery that is mounted into the Battery Case.		

Lithium Battery Dimensional Drawing



ER3V (3.6 V, 1,000 mAh, from Toshiba Battery Co., Ltd.)

When Installing a Battery on the Host Controller

Use a battery that meets the specifications of the host controller.

Use the recommended Battery given in the following table or the equivalent.



Inrush Current Suppression Devices

Inrush current suppression devices prevent equipment from being damaged by inrush current. They are used only when using a SERVOPACK of 5 kW or higher (SGD7S-330A, -470A, -550A, -590A, or -780A) with a DC power supply input.

Selection Table

◆ External Inrush Current Suppression Resistors

Main Circuit	SERVO- PACK	External Inrush Current Suppression Resistor					
Power Supply	Model: SGD7S-	Order Num- ber	Resis- tance $[\Omega]$	Rated Power [W]	Manufacturer	Inquiries	
270 VDC	330A	RH120-5ΩJ	5		lwaki Musen Kenkyusho Co., Ltd.	Yaskawa Controls Co., Ltd.	
	470A						
	550A			70			
	590A	RH120-3ΩJ	3				
	780A	1111120-0320					

◆ Inrush Current Suppression Resistor Short Relays

Main	SERVO-	Main Cir-	Contact	Recommended Inrush Current Suppression Resistor Short Relay			
Circuit Power Supply	PACK Model: SGD7S-	cuit DC Current [Arms]	Specifica- tion	Model	Volt- age Rating [Vdc]	Current Rating [A]	Manufac- turer
	330A	34		G9EA-1-B		60	
·	470A	36	NO	USLA-1-B		00	OMBON
270 VDC	550A	48		G9EA-1-B-CA	400	100	OMRON Corporation
Ī	590A	68		G9EA-1-B-CA*1		200	Corporation
	780A	92		G9EC-1-B*2		200	

^{*1.} Connect two Relays in parallel. Also, maintain the same resistance between the DC power supply and SERVO-PACK for the wiring for each Relay.

 $[\]hbox{*2. This Relay is applicable only when the temperature of the Relay installation environment is $50 {\rm ^\circ C}$ or less.}$

Software

SigmaSize+: AC Servo Capacity Selection Program

You can use the SigmaSize+ to select Servomotors and SERVOPACKs. There are two versions of the software: A cloud version* and a stand-alone version.

The software supports all standard servo products sold by Yaskawa.

* SigmaSize+ is available in Japan only. Contact your Yaskawa representative for information on this program.

Features

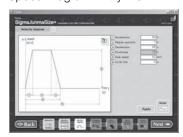
- Provides a vast amount of new product information.
- · Lets you select servo products with a wizard.
- You can access and reuse previously entered data.

■ Examples of the Servo Selection Interface

Mechanism Selection View



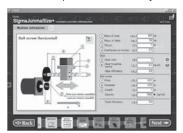
Speed Diagram Entry View



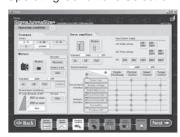
Servomotor Selection View



Machine Specification Entry View



Operating Conditions Selection View



SERVOPACK Selection View



System Requirements

Item	System Requirement
Browser	Internet Explorer version 10 or later
OS	Windows Vista or Windows 7 (32-bit or 64-bit edition)*
CPU	Pentium 200 MHz min.
Memory	64 MB min. (96 MB or greater recommended)
Available Hard Disk Space	20 MB min.

^{* 64-}bit OS is applicable only for the stand-alone version.

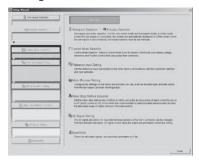
SigmaWin+: AC Servo Drive Engineering Tool

The SigmaWin+ Engineering Tool is used to set up and optimally tune Yaskawa Σ -series Servo Drives.

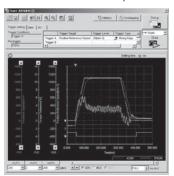
◆ Features

- Set parameters with a wizard.
- Display SERVOPACK data on a computer just like you would on a oscilloscope.
- Estimate moments of inertia and measure vibration frequencies.
- Display alarms and alarm diagnostics.

Setting Parameters with a Wizard



Displaying SERVOPACK Data on a Computer Just Like You Would on a Oscilloscope



Estimating Moments of Inertia and Measuring Vibration Frequencies



Displaying Alarms and Alarm Diagnostics



System Requirements

Item	System Requirement					
item	Ver.5	Ver.7				
Supported Languages	English and Japanese	Japanese, English, and Chinese (simplified)				
OS	Windows XP, Windows Vista, or Windows 7 (32-bit or 64-bit edition)	Windows 10, Windows 8, Windows 8.1, or Windows 7 (32-bit or 64-bit edition)				
Software Environment	_	.NET Framework 4.5, .NET Framework 4.6				
CPU	Pentium 200 MHz min.	1 GHz min. (recommended)				
Memory	64 MB min. (96 MB or greater recommended)	1 GB min. (recommended)				
Available Hard Disk Space	For Standard Setup: 350 MB min. (400 MB or greater recom- mended for installation)	500 MB min.				
Browser used to display Help	_	Internet Explorer 9 or higher				

MPE720 System Integrated Engineering Tool

MPE720 Ver.7 is a system integrated Engineering Tool that provides the complete development functionality to set up, adjust, program, maintain, and inspect not only Controller programs but also all of the devices necessary to design machine installations, including Servo Drives, AC Drives, and Distributed I/O Devices.

It is installed in a PC and operated on a PC interface through a connection between the PC and Machine Controller.

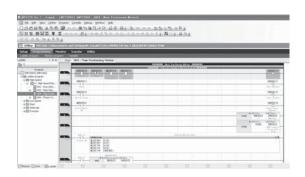
Features

■ Complete Adjustment and Maintenance of Equipment Drive Devices

MPE720 Ver.7 connected to the Σ -7C or MP series machine controllers can be used to set up, adjust, and maintain Servo Drives, AC Drives, and I/O Devices connected to a network. There is no need to change connections, which increases efficiency.

■ Greater Efficiency with the Best Programming Method

Ladder Programming



Motion Programming



- The new user interface lets just about anyone easily use the MPE720.
- An improved EXPRESSION instruction simplifies programming calculation in ladder diagrams.
- Support is provided for all types of control, including position, speed, torque, and phase control.
- Positioning and interpolation can be programmed with one instruction.
- Programs can be very easily edited using expressions in a text format.
- New variable programming can provide PC-like programming.

System Requirements

Item	Specification
CPU	1 GHz or more recommended (manufactured by Intel or other companies)
Memory Capacity	1 GB or more recommended*
Available Hard Disk Space	700 MB or more (includes standard workspace memory after installation of MPE720)
Display Resolution	1280 × 800 pixels or more recommended
CD Drive	1 (only for installation)
Communications Ports	RS-232C, Ethernet, MP2100 bus, and USB
OS	Windows 10, Windows 8, Windows 8.1, or Windows 7 (32-bit or 64-bit)
.NET Environment	.NET Framework 4.5
Supported Languages	English and Japanese

^{*} Expand memory if other application programs are run simultaneously with MPE720 on the same computer. Performance may be slow due to the use of memory by multiple application programs that are run simultaneously.

Σ -7 SERIES

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In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply. Specifications are subject to change without notice for ongoing product modifications and improvements.

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