# Model Designation

### Single Axis Amplifier



1st 3rd digit - Maximum Applicable Motor Capacity				
Code	Specification			
Three-	phase, 400 V			
1R9	0.5 kW			
3R5	1.0 kW			
5R4	1.5 kW			
8R4	2.0 kW			
120	3.0 kW			
170	5.0 kW			
210	6.0 kW			
260	7.5 kW			
280	11.0 kW			
370	15.0 kW			

4th dig	4th digit - Voltage					
Code	Specification					
D	400 V AC					
5th + 6	oth digit - Interface*1					
Code	Specification					
AO	EtherCAT					
AU	communication reference					
CO	PROFINET					
	communication reference					
30	MECHATROLINK-III, RJ45					
	communication reference					
MO	Sigma-7Siec (with built-in single-axis control)					
7th dig	7th digit - Design Revision Order					
В	Standard Model					

8th 10th digit - Hardware Options Specifications					
Code	Specification	Applicable Models			
None	Without Options	All models			
000	Without Options only used in combination with FT/EX	All models			
026*2	With relay for holding brake	All models			
11th	13th digit - FT/EX Spec	cification			
Codo	Consideration				

11th	13th digit - FT/EX Specification
Code	Specification
None	Without Options
F64*3	Zone table
F50	Application function for Sigma-7Siec

Bolded options are considered standard warehouse products.

Depending on configuration choices made, the model code might end after the 7th or 10th digit, or involve all 13 digits.

- \*1. The same SERVOPACKs are used for both rotary and linear servomotors.
- The same services are used to both rotary and inlinear as evolutions.
   For specification of the internal brake relay, please refer to the hardware manual of the amplifier.
   Only available for EtherCAT (CoE) and MECHATROLINK-III communication references.

# Ratings and Specifications

## Ratings

#### Three-phase, 400 VAC

Model SGD7S-			1R9D	3R5D	5R4D	8R4D	120D	170D	210D	260D	280D	370D	
Maximum Applicable Motor Capacity [kW]			0.5	1	1.5	2	3	5	6	7.5	11	15	
Continuous Outp	ut Current [A]		1.9	3.5	5.4	8.4	11.9	16	20.8	25.7	28.1	37.2	
Instantaneous Ma	aximum Output (	Current [A]	5.5	8.5	14	21	28	42	55	65	70	85	
Main Circuit	Power Supply	,		Т	hree-phas	e, 380 VAC	to 480 VA	C, -15% to	+10%, 50	) Hz/60 Hz			
Mairi Gircuit	Input Current	[A]*	1.4	2.9	4.3	5.8	8.6	14.5	17.4	21.7	31.8	43.4	
Control Power Su	Pov	er Supply					24 VDC	±15%					
Control Power St	Inpu	it Current [A]*		1.2						1.4		1.5	
Power Supply Capacity [kVA]*		1.1	2.3	3.5	4.5	7.1	11.7	12.4	14.4	21.9	30.6		
	Main Circuit F	rcuit Power Loss [W]		30	62.3	89.4	136.8	188.7	188.4	228.5	278.2	389.8	
	Control Circui	t Power Loss [W]	21					22	28		32		
Power Loss*	Power Loss* Built-in Regenerative I Power Loss [W]		14	14	28	28	28	36	(18	30)*	(24	0)*	
	Total Power L	oss [W]	54.2	65	111.3	138.4	185.5	246.7	216.4	256.5	310.2	389.8	
	Built-In	Resistance $[\Omega]$	75	75	75	43	43	27		-			
Regenerative	Regenerative Resistor	Capacity [W]	70	70	140	140	140	180		-			
Resistor Minimum Allowa Resistance [Ω]			75	75	75	43	43	27	18		14.	25	
Overvoltage Category							II	l					

<sup>\*</sup> This is the net value at the rated load.

#### 540 VDC

Model SGD7S-			1R9D	3R5D	5R4D	8R4D	120D	170D	210D	260D	280D	370D
Maximum Applicable Motor Capacity [kW]		0.5	1	1.5	2	3	5	6	7.5	11	15	
Continuous Out	out Current	[A]	1.9	3.5	5.4	8.4	11.9	16	20.8	25.7	28.1	37.2
Instantaneous M	laximum Ou	utput Current [A]	5.5	8.5	14	21	28	42	55	65	70	85
Main Circuit	Power S	Supply				513VDC	to 648 VD	C, -15% to	+10%			
Main Circuit	Input Current [A]*		2	3.3	5.5	6.8	11	18	19.6	26.2	38.3	47.6
Control Power Supply		24 VDC ±15 %										
Control Power S	supply	Input Current [A]*		1.2					1.4		1.5	
Power Supply C	apacity [kV/	Α]*	1.1	2.3	3.5	4.5	7.1	11.7	12.4	14.4	21.9	30.6
	Main Cir	rcuit Power Loss [W]	16.4	24.4	48.5	73.7	110.4	144.5	188.4	228.5	278.2	389.8
	Control	Circuit Power Loss [W]			21			22	2	28	3	2
Power Loss* Built-in I Power L		Regenerative Resistor Loss [W]	14	14	28	28	28	36	(18	30)*	(24	O)*
Total Power Loss [W]		37.4	45.4	69.5	94.7	131.4	166.5	216.4	228.5	310.2	389.8	
Overvoltage Category							II					

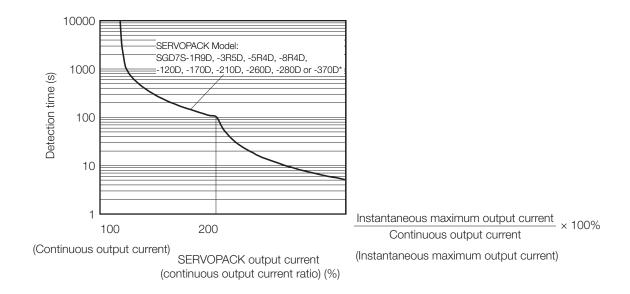
<sup>\*</sup> This is the net value at the rated load.

#### SERVOPACK Overload Protection Characteristics

The overload detection level is set for hot start conditions with a SERVOPACK surrounding air temperature of  $55^{\circ}\text{C}^{*}$ .

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 within the continuous duty zone of the torque-motor speed characteristic of the Servomotor.

 $<sup>^{\</sup>star}$  However, the range for the SGD7S-370D is -5°C to 40°C.

Option Modules

# Specifications using EtherCAT Communication Reference

Item			Specification
Control Method			IGBT-based PWM control, sine wave current drive
	With Rotary Servo	omotor	Serial encoder: 24 bits (incremental encoder/absolute encoder)
Feedback	With Linear Servo	motor	<ul> <li>Absolute linear encoder (The signal resolution depends on the absolute linear encoder.)</li> <li>Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.)</li> </ul>
	Surrounding Air Te	emperature*1	-5°C to 55°C (60°C with derating) However, the range for the SGD7S-370D is -5°C to 40°C.
	Storage Temperature		-20°C to 85°C
	Surrounding Air Humidity		95% relative humidity max. (with no freezing or condensation)
	Storage Humidity Vibration Resistan	ce	95% relative humidity max. (with no freezing or condensation) 4.9 m/s <sup>2</sup>
Environmental	Shock Resistance		19.6 m/s <sup>2</sup>
Conditions	Degree of Protect	ion	IP10
F	Pollution Degree		<ul> <li>Must be no corrosive or flammable gases.</li> <li>Must be no exposure to water, oil, or chemicals.</li> <li>Must be no dust, salts, or iron dust.</li> </ul>
	Altitude		1,000 m or less (above 1,000 m with derating)
	Others		Do not use the SERVOPACK in the following locations: Locations subject to static electricity
Applicable Standard	ds		noise, strong electromagnetic/magnetic fields, or radioactivity  Refer to the section Compliance with UL Standards, EU Directives, and Other Safety Standards (in Combination with SERVOPACK).
Mounting			Base-mounted
	Speed Control Ra	nge	1:5,000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)
			±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)
Performance	Coefficient of Spe	ed Fluctuation*2	0% of rated speed max. (for a voltage fluctuation of $\pm 10$ %)
			±0.1% of rated speed max. (for a temperature fluctuation of 25 °C ±25 °C)
	Torque Control Precision (Repeatability)		±1%
	Soft Start Time Se	etting	0s to 10s (Can be set separately for acceleration and deceleration.)
	Encoder Divided F	Pulse Output	Phase A, phase B, phase C: Line-driver output  Number of divided output pulses: Any setting is allowed
	Linear Servomoto	r Overheat Protection	Number of input points: 1
	Signal Input		Input voltage range: 0 V to +5 V Allowable voltage range: 24 VDC ±20 %
	Sequence Input Signals	Input Signals that can be allocated	Number of input points: 7 Input method: Sink inputs or source inputs Input Signals  • P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals  • /Probe1 (Probe 1 Latch Input) signal  • /Probe2 (Probe 2 Latch Input) signal  • /Home (Home Switch Input) signal  • /P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals  • /SI0 and /SI3 (General-Purpose Input) signals  A signal can be allocated and the positive and negative logic can be changed.
		Fixed Output	Allowable voltage range: 5 VDC to 30 VDC
		Fixed Output	Number of output points: 1 Output signal: ALM (Servo Alarm) signal
I/O Signals			Allowable voltage range: 5 VDC to 30 VDC Number of output points: 5 (A photocoupler output (isolated) is used.) Output Signals  • /COIN (Positioning Completion) signal
	Sequence Output Signals	Output Signals that can be allocated	//-CMP (Speed Coincidence Detection) signal     //-CMP (Speed Coincidence Detection) signal     //-CAMP (Servo Ready) signal     //-CLT (Torque Limit Detection) signal     //-CLT (Torque Limit Detection) signal     //
	DS 400A	Interfaces	Digital Operator (JUSP-0P05A-1-E)
	RS-422A Communications	1:N Communications	Up to N = 15 stations possible for RS-422A port
Communicati	(CN502)	Axis Address Setting	Set with parameters.
Communications		Interface	Personal Computer (with SigmaWin+)
	USB Communications (CN7)	Communications	The software version of the SigmaWin+ must be version 7.11 or higher.
		Standard	Conforms to USB 2.0 standard (12 Mbps).

### SERVOPACKs SGD7S

Continued from previous page.

Item		Specification		
Displays/Indicators		CHARGE, PWR, RUN, ERR, and L/A (A and B) indicators, and one-digit seven- segment display		
EtherCAT Communica	tions Setting Switches	EtherCAT secondary address (S1 and S2), 16 positions		
	Applicable Communications Standards	IEC 61158 Type 12, IEC 61800-7 CiA402 Drive Profile		
	Physical Layer	100BASE-TX (IEEE 802.3)		
	Communications Connectors	CN6A (RJ45): EtherCAT signal input connector CN6B (RJ45): EtherCAT signal output connector		
	Cable	Category 5, 4 shielded twisted pairs  * The cable is automatically detected with AUTO MDIX.		
	Sync Manager	SM0: Mailbox output, SM1: Mailbox input, SM2: Process data output, and SM3: Process data input		
EU CAT	FMMU	FMMU 0: Mapped in process data output (RxPDO) area.  FMMU 1: Mapped in process data input (TxPDO) area.  FMMU 2: Mapped to mailbox status.		
EtherCAT Communications	EtherCAT Commands (Data Link Layer)	APRD, FPRD, BRD, LRD, APWR, FPWR, BWR, LWR, ARMW, and FRMW (APRW, FPRW, BRW, and LRW commands are not supported.)		
	Process Data	Assignments can be changed with PDO mapping.		
	Mailbox (CoE)	Emergency messages, SDO requests, SDO responses, and SDO information (TXPDO/RXPDO and remote TXPDO/RXPDO are not supported.)		
	Distributed Clocks	Free-Run Mode and DC Mode (Can be switched.)  Applicable DC cycles: 125 µs to 4 ms in 125-µs increments		
	Slave Information Interface	256 bytes (read-only)		
	Indicators	EtherCAT communications in progress: Link/Activity x 2 EtherCAT communications status: RUN x 1 EtherCAT error status: ERR x 1		
CiA402 Drive Profile		Homing Mode Profile Position Mode Interpolated Position Mode Profile Velocity Mode Profile Torque Mode Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode Cyclic Synchronous Torque Mode Touch Probe Function Torque Limit Function		
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 Processi	ng	Built-in Refer to the catalog for details.		
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		
Applicable Option Mod	dules	Fully-closed Modules, Option Module Safety		

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

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

<sup>\*1.</sup> If you combine a Sigma-7 SERVOPACK with a Sigma-V Option Module, the surrounding air temperature specification of the Sigma-V SERVOPACKs must be used, i. e., 0 °C to 55 °C. Also, the applicable surrounding range cannot be increased by derating.

<sup>\*3.</sup> The SGD7S-210D, -260D, -280D, and -370D do not have a dynamic brake (DB). If a dynamic brake is necessary, create an external dynamic brake circuit.

 $<sup>^{\</sup>star}4.$  Always perform risk assessment for the system and confirm that the safety requirements are met.

# Specifications using Sigma-7Siec Communication Reference

Item			Specification
Control Method			IGBT-based PWM control, sine wave current drive
	With Rotary Servo	omotor	Serial encoder: 24 bits (incremental encoder/absolute encoder)
Feedback	With Linear Servo	motor	<ul> <li>Absolute linear encoder (The signal resolution depends on the absolute linear encoder.)</li> <li>Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.)</li> </ul>
	Surrounding Air Te	emperature*1	-5°C to 55°C (60°C with derating) However, the range for the SGD7S-370D is -5°C to 40°C.
	Storage Temperature		-20°C to 85°C
	Surrounding Air Humidity		95% relative humidity max. (with no freezing or condensation)
	Storage Humidity Vibration Resistan	ice.	95% relative humidity max. (with no freezing or condensation) 4.9 m/s <sup>2</sup>
Environmental	Shock Resistance		19.6 m/s <sup>2</sup>
Conditions	Degree of Protect	ion	IP10
	Pollution Degree		<ul> <li>Must be no corrosive or flammable gases.</li> <li>Must be no exposure to water, oil, or chemicals.</li> <li>Must be no dust, salts, or iron dust.</li> </ul>
	Altitude		1,000 m or less (above 1,000 m with derating)
	Others		Do not use the SERVOPACK in the following locations: Locations subject to static electricity
Applicable Standard	ds		noise, strong electromagnetic/magnetic fields, or radioactivity  Refer to the section Compliance with UL Standards, EU Directives, and Other Safety Standards (in Combination with SERVOPACK).
Mounting			Base-mounted
	Speed Control Ra	nge	1:5,000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)
			±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)
Performance	Coefficient of Speed Fluctuation*2		0% of rated speed max. (for a voltage fluctuation of $\pm 10\%$ )
			±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)
	Torque Control Precision (Repeatability)		±1%
	Soft Start Time Se	etting	0s to 10s (Can be set separately for acceleration and deceleration.)
	Encoder Divided F	Pulse Output	Phase A, phase B, phase C: Line-driver output  Number of divided output pulses: Any setting is allowed
	Linear Servomoto	r Overheat Protection	Number of input points: 1
	Signal Input		Input voltage range: 0 V to +5 V
	Sequence Input Signals	Input Signals that can be allocated	Number of input points: 7 Input method: Sink inputs or source inputs Input Signals  P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals  Probe1 (Probe 1 Latch Input) signal  Probe2 (Probe 2 Latch Input) signal  Prome (Home Switch Input) signal  P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals  Sl0 and /Sl3 (General-Purpose Input) signals  A signal can be allocated and the positive and negative logic can be changed.
		Fixed Output	Allowable voltage range: 5 VDC to 30 VDC
		Fixed Output	Number of output points: 1 Output signal: ALM (Servo Alarm) signal
I/O Signals			Allowable voltage range: 5 VDC to 30 VDC  Number of output points: 5  (A photocoupler output (isolated) is used.)  Output Signals  • /COIN (Positioning Completion) signal
	Sequence Output Signals	Output Signals that can be allocated	<ul> <li>/V-CMP (Speed Coincidence Detection) signal</li> <li>/TGON (Rotation Detection) signal</li> <li>/S-RDY (Servo Ready) signal</li> <li>/CLT (Torque Limit Detection) signal</li> <li>/VLT (Speed Limit Detection) signal</li> <li>/BK (Brake) signal</li> <li>/BK (Warning) signal</li> <li>/WARN (Warning) signal</li> <li>/NEAR (Near) signal</li> <li>/ZONE0 (ZONE Signal 1 Output) signal</li> <li>/ZONE1 (ZONE Signal 2 Output) signal</li> <li>/ZONE2 (ZONE Signal 3 Output) signal</li> <li>/ZONE3 (ZONE Signal 4 Output) signal</li> <li>/ZONE3 (ZONE Signal 4 Output) signal</li> <li>/ZONE (nZONE Output) signal</li> </ul>
		Interfaces	A signal can be allocated and the positive and negative logic can be changed.  Digital Operator (JUSP-OP05A-1-E)
	RS-422A		
			Up to N = 15 stations possible for RS-422A port
		1:N Communications	Up to N = 15 stations possible for RS-422A port Set with parameters.
Communications	Communications (CN502)	1:N Communications Axis Address Setting	Up to N = 15 stations possible for RS-422A port Set with parameters. Personal Computer (with SigmaWin+)
Communications	Communications	1:N Communications	Set with parameters.

### SERVOPACKs SGD7S

Continued from previous page.

Item		Specification		
Displays/Indicators		CHARGE, PWR, RUN, ERR, and L/A (A and B) indicators, and one-digit seven-		
	cations Setting Switches	segment display  EtherCAT secondary address (S1 and S2), 16 positions		
Ethor G/ (1 Gorni harne	Applicable Communications Standards	IEC 61158 Type 12, IEC 61800-7 CiA402 Drive Profile		
	Physical Layer	100BASE-TX (IEEE 802.3)		
	Communications Connectors	CN6A (RJ45): EtherCAT signal input connector CN6B (RJ45): EtherCAT signal output connector		
	Cable	Category 5, 4 shielded twisted pairs  * The cable is automatically detected with AUTO MDIX.		
	Sync Manager	SM0: Mailbox output, SM1: Mailbox input, SM2: Process data output, and SM: Process data input		
Ethor CAT	FMMU	FMMU 0: Mapped in process data output (RxPDO) area.  FMMU 1: Mapped in process data input (TxPDO) area.  FMMU 2: Mapped to mailbox status.		
EtherCAT Communications	EtherCAT Commands (Data Link Layer)	APRD, FPRD, BRD, LRD, APWR, FPWR, BWR, LWR, ARMW, and FRMW (APRW, FPRW, BRW, and LRW commands are not supported.)		
	Process Data	Assignments can be changed with PDO mapping.		
	Mailbox (CoE)	Emergency messages, SDO requests, SDO responses, and SDO information (TxPDO/RxPDO and remote TxPDO/RxPDO are not supported.)		
	Distributed Clocks	Free-Run Mode and DC Mode (Can be switched.)  Applicable DC cycles: 125 µs to 4 ms in 125-µs increments		
	Slave Information Interface	256 bytes (read-only)		
	Indicators	EtherCAT communications in progress: Link/Activity x 2 EtherCAT communications status: RUN x 1 EtherCAT error status: ERR x 1		
CiA402 Drive Profile		<ul> <li>Interpolated Position Mode</li> <li>Profile Velocity Mode</li> <li>Profile Torque Mode</li> <li>Cyclic Synchronous Position Mode</li> <li>Cyclic Synchronous Velocity Mode</li> <li>Cyclic Synchronous Torque Mode</li> <li>Touch Probe Function</li> <li>Torque Limit Function</li> </ul>		
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 Proces	sing	Built-in Refer to the catalog for details.		
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		
Applicable Option Modules		Fully-closed Modules, Option Module Safety		

<sup>\*1.</sup> If you combine a Sigma-7 SERVOPACK with a Sigma-V Option Module, the surrounding air temperature specification of the Sigma-V SERVOPACKs must be used, i. e., 0 °C to 55 °C. Also, the applicable surrounding range cannot be increased by derating.



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

<sup>\*3.</sup> The SGD7S-210D, -260D, -280D, and -370D do not have a dynamic brake (DB). If a dynamic brake is necessary, create an external dynamic brake circuit.

 $<sup>^{\</sup>star}4.$  Always perform risk assessment for the system and confirm that the safety requirements are met.

# Specifications using MECHATROLINK-III Communication Reference

Item			Specification
Drive Method			IGBT-based PWM control, sine wave current drive
	With Rotary Servon	notor	Serial encoder: 24 bits (incremental encoder/absolute encoder)
Feedback	With Linear Servom	otor	<ul> <li>Absolute linear encoder (The signal resolution depends on the absolute linear encoder</li> <li>Incremental linear encoder (The signal resolution depends on the incremental linear encoder or Serial Converter Unit.)</li> </ul>
	Surrounding Air Ten	nperature*1	-5°C to 55°C (60°C with derating) However, the range for the SGD7S-370D is -5°C to 40°C.
	Storage Temperature		-20°C to 85°C
	Surrounding Air Hur		95% relative humidity max. (with no freezing or condensation)
	Storage Humidity		95% relative humidity max. (with no freezing or condensation)
	Vibration Resistance	Э	4.9 m/s <sup>2</sup>
Environmental	Shock Resistance		19.6 m/s <sup>2</sup>
Conditions	Degree of Protection	n	IP10 2
	Pollution Degree		<ul> <li>Must be no corrosive or flammable gases.</li> <li>Must be no exposure to water, oil, or chemicals.</li> <li>Must be no dust, salts, or iron dust.</li> </ul>
	Altitude		1,000 m or less (above 1,000 m with derating)
	Others		Do not use the SERVOPACK in the following locations: Locations subject to static electricity
Applicable Standards			noise, strong electromagnetic/magnetic fields, or radioactivity  Refer to the section Compliance with UL Standards, EU Directives, and Other Safety Standard (in Combination with SERVOPACK).
Mounting			Base-mounted
			1:5,000 (At the rated torque, the lower limit of the speed control range must not cause the
	Speed Control Rang	ge	Servomotor to stop.)
			±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)
	Coefficient of Speed		0 % of rated speed max. (for a voltage fluctuation of ± 10 %)
Performance	Fluctuation*2		
	T		±0.1% of rated speed max. (for a temperature fluctuation of 25 °C ± 25 °C)
	Torque Control Precision (Repeatability)		±1%
	Soft Start Time Sett	ing	0s to 10s (Can be set separately for acceleration and deceleration.)
	Encoder Divided Pu	Ilse Output	Phase A, phase B, phase C: Line-driver output
		·	Number of divided output pulses: Any setting is allowed.  Number of input points: 1
	Linear Servomotor Overheat Protection Signal Input		Input voltage range: 0 V to +5 V
	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  - /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) signal  - /P-DET (Polarity Detection) 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: ALM (Servo Alarm) signal
I/O Signals	Sequence Output Signals	Output Signals that can be allocated	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 5 (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  • /WLR (Brake) signal  • /WARN (Warning) signal  • /MEAR (Near) signal  • /ZONE0 (ZONE Signal 1 Output) signal  • /ZONE1 (ZONE Signal 2 Output) signal  • /ZONE2 (ZONE Signal 3 Output) signal  • /ZONE3 (ZONE Signal 4 Output) signal  • /ZONE3 (ZONE Signal 4 Output) signal  • /ZONE0 (INCONE Signal 4 Output) signal  • /ZONE3 (ZONE Signal 4 Output) signal  • /ZONE3 (ZONE Signal 4 Output) signal  • /IZONE3 (ZONE Signal 4 Output) signal  • /IZONE4 (INCONE Signal 5 Output) signal  • /IZONE5 (INCONE Signal 6 Output) signal  • /IZONE5 (INCONE Signal 7 Output) signal  • /IZONE6 (INCONE Signal 8 Output) signal  • /IZONE7 (INCONE Signal 8 Output) signal
	DO 4004 C	Interfaces	Digital Operator (JUSP-OP05A-1-E)
	RS-422A Commu-	1:N Communications	Up to N = 15 stations possible for RS-422A port
Communication	nications (CN3)	Axis Address Setting	Set with parameters.
Communications			Personal Computer (with SigmaWin+)
	USB Communica-	Interface	The software version of the SigmaWin+ must be version 7.11 or higher.
	tions (CN7)	Communications Standard	Conforms to USB 2.0 standard (12 Mbps).
		Januaru	

### SERVOPACKs SGD7S

Continued from previous page.

Item		Specification		
	Communications Protocol	MECHATROLINK-III		
MECHATROLINK-III	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.		
Communications	Transmission Speed	100 Mbps		
	Transmission Cycle	125 μs, 250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms) 32 or 48 bytes/station		
	Number of Transmission Bytes	A DIP switch (S3) is used to select the number of transmission bytes.		
	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.)		
	Profile	MEACHATROLINK-III standard servo profile		
MECHATROLINK-III Communications Setting Switches  Analog Monitor (CN5)  Dynamic Brake (DB)		Rotary switch (S1 and S2) positions: 16  Number of DIP switch (S3) pins: 4  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)  Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.		
Regenerative Process	sing	Built-in Refer to the catalog for details.		
Overtravel (OT) Preve	ntion	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		
Applicable Option Mo	odules	Fully-closed Modules		

<sup>\*1.</sup> If you combine a Sigma-7 SERVOPACK with a Sigma-V Option Module, the surrounding air temperature specification of the Sigma-V SERVOPACKs must be used, i. e., 0 °C to 55 °C. Also, the applicable surrounding range cannot be increased by derating.

 $\ensuremath{^{\star}} 2.$  The coefficient of speed fluctuation for load fluctuation is defined as follows:

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

<sup>\*3.</sup> The SGD7S-210D, -260D, -280D, and -370D do not have a dynamic brake (DB). If a dynamic brake is necessary, create an external dynamic brake circuit.

 $<sup>^{\</sup>star}4.$  Always perform risk assessment for the system and confirm that the safety requirements are met.

# Specifications using PROFINET Communication Reference

Item			Specification	
Control Method			IGBT-based PWM control, sine wave current drive	
	With Rotary Servomotor		Serial encoder: 24 bits (incremental encoder/absolute encoder)	
Feedback	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*1		-5°C to 55°C (60°C with derating) However, the range for the SGD7S-370D is -5°C to 40°C.	
	Storage Temperature		-20°C to 85°C	
	Surrounding Air H	umidity	95% relative humidity max. (with no freezing or condensation)	
	Storage Humidity		95% relative humidity max. (with no freezing or condensation)	
	Vibration Resistan Shock Resistance		4.9 m/s <sup>2</sup>	
Environmental	Degree of Protecti		IP10	
Conditions	Pollution Degree		<ul><li>Must be no corrosive or flammable gases.</li><li>Must be no exposure to water, oil, or chemicals.</li></ul>	
	Altitude		Must be no dust, salts, or iron dust.  1,000 m or less (above 1,000 m with derating)	
			Do not use the SERVOPACK in the following locations: Locations subject to static electricity	
Applicable Standard	Others ds		noise, strong electromagnetic/magnetic fields, or radioactivity Refer to the section Compliance with UL Standards, EU Directives, and Other Safety Standards (in Combination with SERVOPACK).	
Mounting			Base-mounted	
ouriding	Speed Control Ra	nge	1:5,000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)	
			±0.01 % of rated speed max. (for a load fluctuation of 0 % to 100 %)	
D (	Coefficient of Speed Fluctuation*2		0% of rated speed max. (for a voltage fluctuation of ±10%)	
Performance	occinion of opera haddadion		±0.1% of rated speed max. (for a temperature fluctuation of 25 °C ±25 °C)	
	Torque Control Precision (Repeatability)		±1%	
	Soft Start Time Setting		0s to 10s (Can be set separately for acceleration and deceleration.)	
	Encoder Divided Pulse Output		Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed	
	Linear Servomotor Overheat Protection Signal Input		Number of input points: 1 Input voltage range: 0 V to +5 V	
	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 P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals FEXT1 (Probe 1 Latch Input) signal FEXT2 (Probe 2 Latch Input) signal FEXT2 (Probe 2 Latch Input) signal PEC (Home Switch Input) signal P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals Slo and /SI6 (General-Purpose Input) signals Signal can be allocated and the positive and negative logic can be changed. Allowable voltage range: 5 VDC to 30 VDC	
I/O Signals		Fixed Output	Number of output points: 1 Output signal: ALM (Servo Alarm) signal	
	Sequence Output Signals	Output Signals that can be allocated	Allowable voltage range: 5 VDC to 30 VDC  Number of output points: 5  (A photocoupler output (isolated) is used.)  Output Signals  • /COIN (Positioning Completion) signal  • /Y-CMP (Speed Coincidence Detection) signal  • /Y-CMP (Speed Coincidence Detection) signal  • /Y-CMP (Speed Coincidence Detection) signal  • /Y-CMP (Servo Ready) signal  • /S-RDY (Servo Ready) signal  • /CLT (Torque Limit Detection) signal  • /VLT (Speed Limit Detection) signal  • /WLT (Speed Limit Detection) signal  • /WLT (Spead Limit Detection) signal	
	RS-422A	Interfaces	Digital Operator (JUSP-OP05A-1-E)	
		1:N Communications	Up to N = 15 stations possible for RS-422A port	
0	(CN502)	Axis Address Setting	Set with parameters.	
Communications	USB Communi-	Interface	Personal Computer (with SigmaWin+) The software version of the SigmaWin+ must be version 7.28 or higher.	
	cations (CN7)	Communications Standard	Conforms to USB 2.0 standard (12 Mbps).	

Continued on next page.

### SERVOPACKs SGD7S

Continued from previous page.

Item		Specification		
Displays/Indicators		CHARGE, PWR, RUN, ERR, and L/A (A and B) indicators, and one-digit seven-segment display		
	Applicable Communications Standards	IEC 61158 Type 12, IEC 61800-7 PROFIdrive Profile, Ethernet PROFINET IO RT		
	Physical Layer	100BASE-TX (IEEE 802.3)		
	Communications Connectors	CN6A (RJ45): PROFINET signal input connector CN6B (RJ45): PROFINET signal output connector Full-duplex, Auto-negotiation, Auto-crossover		
	Cable	Category 5, 4 shielded twisted pairs		
	Baud Rate Setting	* The cable is automatically detected with AUTO MDIX.  100 MBit/s		
PROFINET	Supported Protocols	RTC - Real time cyclic protocol - RT class 1 (unsynchronized) RTA - Real time acyclic protocol DCP - Discovery and configuration protocol CL-RPC - Connectionless remote procedure call LLDP - Link layer discovery protocol SNMP - Simple network management protocol		
Communications	Node Address Setting	DCP		
	Indentification & Maintenance Functions	I&MO-3		
	Topology Recognition	LLDP, SNMP V1, MIB2		
	Power Supply	5V±5%, 500 mA (max.) supplied internal from drive CN10		
	LED Indicator	Red (ERR), Green (RUN), PROFINET communicating (L/A) × 2		
	Node Type	Axis Drive Unit		
	Acyclic Parameter Access	Read/Write Record		
	Cyclic Messaging	Set of pre-defined standard telegram: ST1, ST2, ST7, ST8, ST9 Set of pre-defined manufacture telegram: Telegram number 100 Telegram mapping: Dynamic with max. 16 signal entries of free telegram number 999		
	Alarm Notification PDU	Optional		
	Standard	IEC 61800-7-1/2/3		
	Motor Type / Axis Type	Servo / Rotary, Linear		
	Profile Services	Cycle messaging, Acyclic parameter access mechanism, Identification & maintenance functions (I&M03), PROFIdrive parameters, Diagnostic and alarm mechanism, Fault buffer mechanism		
PROFIdrive Profile	Application Classes	1, 3		
	PROFIdrive Position and Velocity Modes	Motion profile type: Linear  CIA402 Supported methods: 1-6, 17-22, 35, 33, 34		
	CIA402 Homing Modes	Motion profile type: Linear  Homing persistent in absolute motor encoder		
	CIA402 Torque Mode	Torque Profile Type: Linear		
Drive Profile		<ul> <li>Homing Mode</li> <li>PROFIdrive Position Mode</li> <li>PROFIdrive Velocity Mode</li> <li>Profile Torque Mode</li> <li>Touch Probe Function</li> <li>Torque Limit Function</li> </ul>		
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. Refer to the catalog for details.		
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		
Applicable Option Me	odules	Fully-closed Modules, Option Module Safety		

<sup>\*1.</sup> If you combine a Sigma-7 SERVOPACK with a Sigma-V Option Module, the surrounding air temperature specification of the Sigma-V SERVOPACKs must be used, i. e., 0 °C to 55 °C. Also, the applicable surrounding range cannot be increased by derating.

 $^{\star}2.$  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

 $<sup>^{\</sup>star}3$ . The SGD7S-210D, -260D, -280D, and -370D do not have a dynamic brake (DB). If a dynamic brake is necessary, create an external dynamic brake circuit.

<sup>\*4.</sup> Always perform risk assessment for the system and confirm that the safety requirements are met.

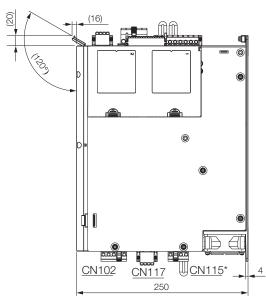
# Front Cover Dimensions and Connector Specifications

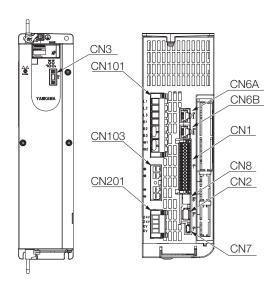
The front cover dimensions and panel connectors depend on the SERVOPACK interface. Refer to the following figures.

#### Front Cover Dimensions and Connector Specifications

The front cover dimensions and panel connector section are the same for all models. Refer to the following figures and table.

#### • Front Cover Dimensions and Connectors





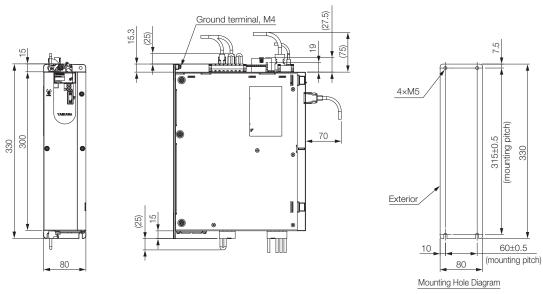
#### • Connector Specifications

Connector No.	Function	Model	YASKAWA Order Code	Number of Pins	Manufacturer
CN1	I/O Connector	DFMC1,5/15-ST-3,5-LRBK	JUSP-7CN001	30	Phoenix Contact
CN2	Encoder Connector	-	JZSP-CMP9-1-E	6	Sumitomo 3M Ltd.
CN3	Digital Operator	-	-	14	Honda Tsushin Kogyo Co., Ltd.
CN6A/ CN6B	Fieldbus Connector	-	-	8	Tyco Electronics Japan G.K.
CN7	USB Connector for Sig- maWin	-	-	5	Tyco Electronics Japan G.K.
CN8	Safety Connector Kit	-	2013595-1	8	Tyco Electronics Japan G.K.
CN8	Safety Jumper Connector	-	JZSP-CVH05-E	8	Tyco Electronics Japan G.K.
01101	Main Power Connector SGD7S-1R9D to -170D	BLZ 7.62HP/08/180LR SN BK BX PRT	JUSP-7CN101	8	Weidmüller
CN101	Main Power Connector SGD7S-210D to -370D	BUZ 10.16HP/07/180F AG BK BX LPR SO	JUSP-7CN101-1	7	Weidmüller
CN102	Motor Power Connector SGD7S-1R9D to -170D	BLZ 7.62IT/04/180MF4 SN BK BX PRT	JUSP-7CN102	4	Weidmüller
GN102	Motor Power Connector SGD7S-210D to -370D	BUZ 10.16IT/04/180MF4 AG BK BX LPR SO	JUSP-7CN102-1	4	Weidmüller
CN103	DC Power Input SGD7S-1R9D to -170D	BVZ 7.62IT/04/180MF3 SN BK BX PRT	JUSP-7CN103	4	Weidmüller
CIVIOS	DC Power Input SGD7S-210D to -370D	BUZ 10.16IT/04/180MF3 AG BK BX LPR SO	JUSP-7CN103-1	4	Weidmüller
CN115	Dynamic Brake Connector SGD7S-1R9D to -170D	BLZ 7.62IT/03/180MF2 SN BK BX PRT	JUSP-7CN115	3	Weidmüller
CIVITO	Dynamic Brake Connector SGD7S-210D to -370D	No integrated Dynamic Brake circuit.	External Dynamic Brak	e circuit is p	ossible as an option.
CN117	Holding Brake Connector	BLF 5.08HC/04/180LR SN BK BX SO	JUSP-7CN117	4	Weidmüller
CN201	24 V Control Power Input	BLF 5.08HC/04/180LR SN OR BX SO	JUSP-7CN201	4	Weidmüller

<sup>\*</sup> Dynamic Brake Connector only for SGD7S-1R9D up to -170D.

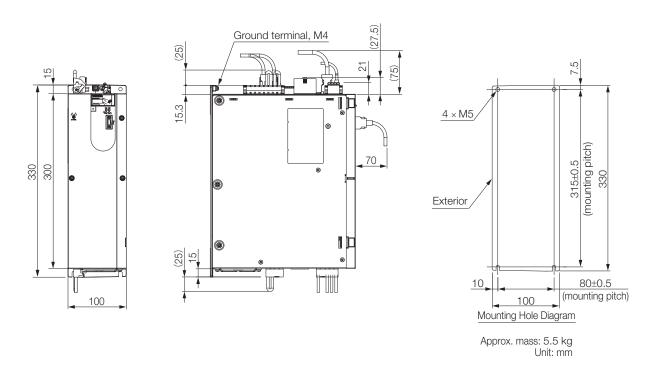
#### Dimensions of base-mounted SERVOPACKs

• Three-Phase, 400 VAC: SGD7S-1R9D, -3R5D, -5R4D, -8R4D, and -120D

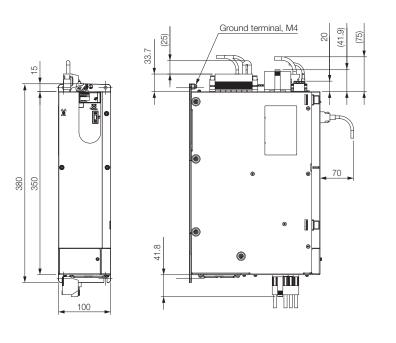


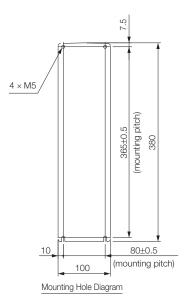
Approx. mass: SGD7S-1R9D, -3R5D, or -5R4D: 3.4 kg SGD7S-8R4D or -120D: 3.7 kg Unit: mm

#### • Three-Phase, 400 VAC: SGD7S-170D



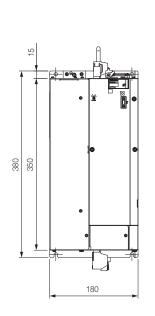
#### • Three-Phase, 400 VAC: SGD7S-210D and -260D

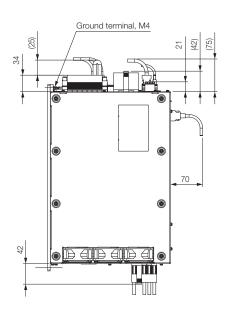


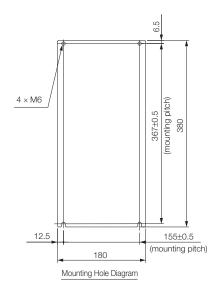


Approx. mass: 7.0 kg Unit: mm

#### • Three-Phase, 400 VAC: SGD7S-280D and -370D



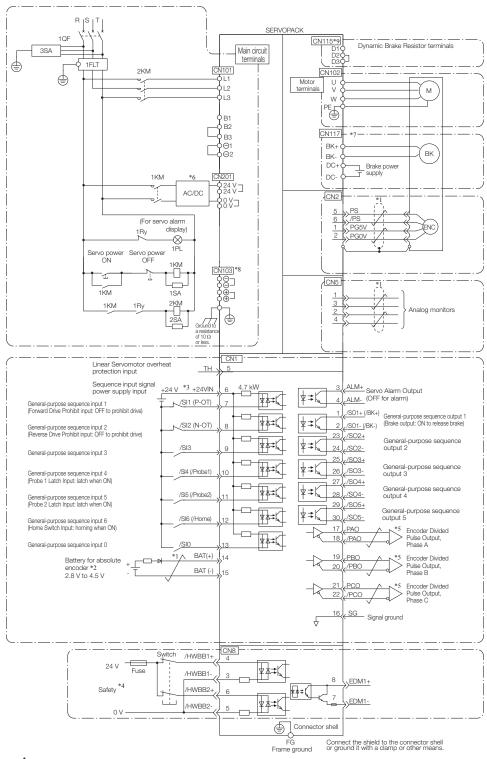




Approx. mass: 13.5 kg Unit: mm

# System Configurations up to 5 kW

#### SGD7S Single-axis EtherCAT Reference **SERVOPACKs**



<sup>2.</sup> Connect these when using an absolute encoder. If the Encoder Cable with a Battery Case is connected, do not connect a backup battery.

3. The 24-VDC power supply is not provided by Yaskawa. Use a 24-VDC power supply with double insulation or reinforced insulation.

4. Refer to the manual if you use a safety function device. If you do not use the safety function, insert the Safety Jumper Connector (provided as an accessory) into CN8 when you use the SERVOPACK.

5. Always use line receivers to receive the output signals.

6. Use an SELV-compliant power supply according to EN/IEC 60950-1 to input 24-VDC to the control power supply input terminals.

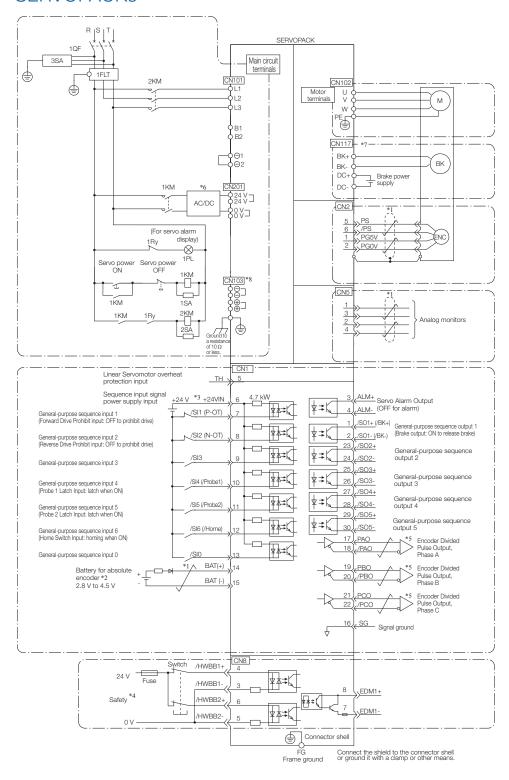
7. The CN117 connector is only used for SERVOPACKs with built-in Servomotor brake control, SGD7S-cooDooB026F64 and SGD7W-cooDooB026.

8. If using these terminals, contact your YASKAWA representative.

9. The CN115 Dynamic Brake Connector is only for SGD7S-1R9D up to -170D.

# System Configurations with 6kW and more

#### SGD7S Single-axis EtherCAT Reference **SERVOPACKs**





<sup>2.</sup> Contributing an aussume encouer, if the Encoder Cable with a Battery Case is connected, do not connect a backup battery.

3. The 24-VDC power supply is not provided by Yaskawa. Use a 24-VDC power supply with double insulation or reinforced insulation.

4. Refer to the manual if you use a safety function device. If you do not use the safety function, insert the Safety Jumper Connector (provided as an accessory) into CN8 when you use the SERVOPACK.

5. Always use line receivers to receive the output signals.

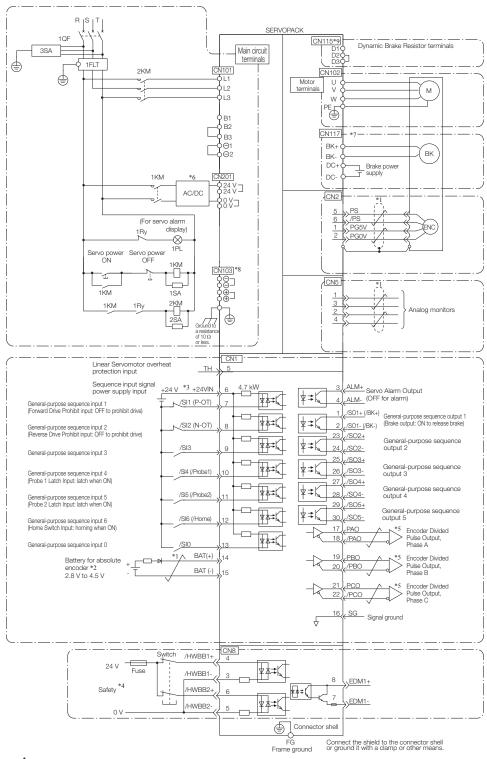
6. Use an SELV-compliant power supply according to EN/IEC 60950-1 to input 24-VDC to the control power supply input terminals.

7. The CN117 connector is only used for SERVOPACKs with built-in Servomotor brake control, SGD7S-oooDooB026F64 and SGD7W-oooDooB026.

8. If using these terminals, contact your YASKAWA representative.

# System Configurations up to 5 kW

#### SGD7S Single-axis PROFINET Reference **SERVOPACKs**



<sup>2.</sup> Connect these when using an absolute encoder. If the Encoder Cable with a Battery Case is connected, do not connect a backup battery.

3. The 24-VDC power supply is not provided by Yaskawa. Use a 24-VDC power supply with double insulation or reinforced insulation.

4. Refer to the manual if you use a safety function device. If you do not use the safety function, insert the Safety Jumper Connector (provided as an accessory) into CN8 when you use the SERVOPACK.

5. Always use line receivers to receive the output signals.

6. Use an SELV-compliant power supply according to EN/IEC 60950-1 to input 24-VDC to the control power supply input terminals.

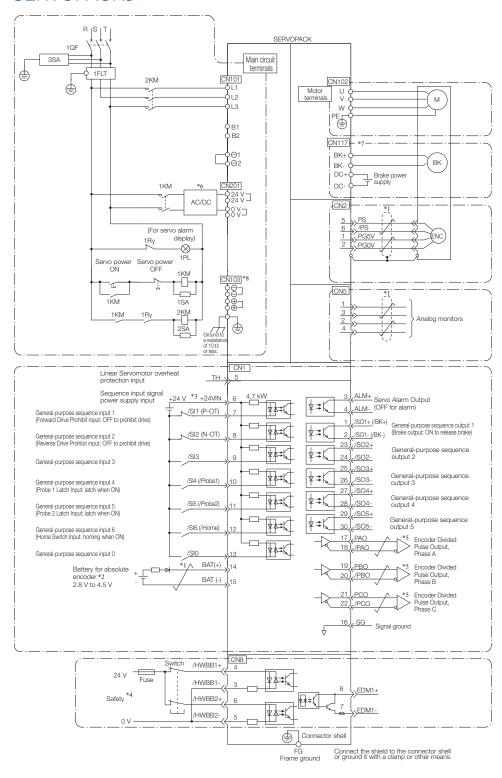
7. The CN117 connector is only used for SERVOPACKs with built-in Servomotor brake control, SGD7S-cooDooB026F64 and SGD7W-cooDooB026.

8. If using these terminals, contact your YASKAWA representative.

9. The CN115 Dynamic Brake Connector is only for SGD7S-1R9D up to -170D.

# System Configurations with 6kW and more

#### SGD7S Single-axis PROFINET Reference **SERVOPACKs**





<sup>2.</sup> Contributing an aussume encouer, if the Encoder Cable with a Battery Case is connected, do not connect a backup battery.

3. The 24-VDC power supply is not provided by Yaskawa. Use a 24-VDC power supply with double insulation or reinforced insulation.

4. Refer to the manual if you use a safety function device. If you do not use the safety function, insert the Safety Jumper Connector (provided as an accessory) into CN8 when you use the SERVOPACK.

5. Always use line receivers to receive the output signals.

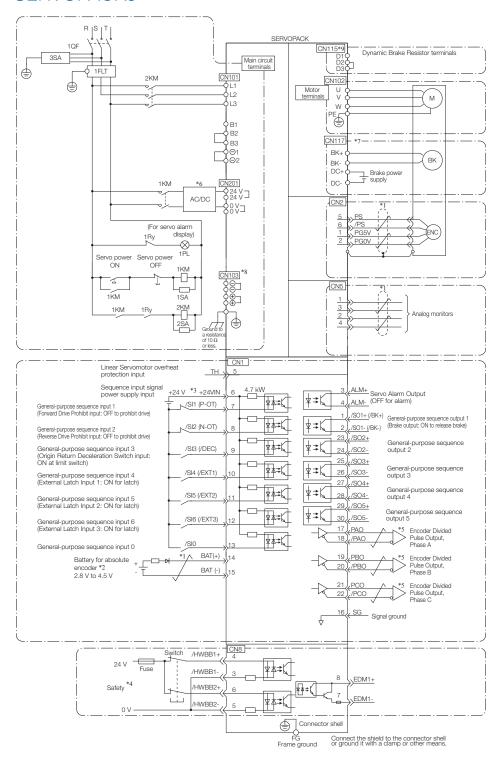
6. Use an SELV-compliant power supply according to EN/IEC 60950-1 to input 24-VDC to the control power supply input terminals.

7. The CN117 connector is only used for SERVOPACKs with built-in Servomotor brake control, SGD7S-oooDooB026F64 and SGD7W-oooDooB026.

8. If using these terminals, contact your YASKAWA representative.

# System Configurations up to 5 kW

#### SGD7S Single-axis MECHATROLINK-III Reference **SERVOPACKs**



- Connect these when using an absolute encoder. If the Encoder Cable with a Battery Case is connected, do not connect a backup battery.

  The 24-VDC power supply is not provided by Yaskawa. Use a 24-VDC power supply with double insulation or reinforced insulation.

  Refer to the manual if you use a safety function device. If you do not use the safety function, insert the Safety Jumper Connector (provided as an accessory) into CN8 when you use the SERVOPACK.

  Always use line receivers to receive the output signals.
- o. Aways use title receivers to receive the output signals.

  16. Use an SELV-compliant power supply according to EN/IEC 60950-1 to input 24-VDC to the control power supply input terminals.

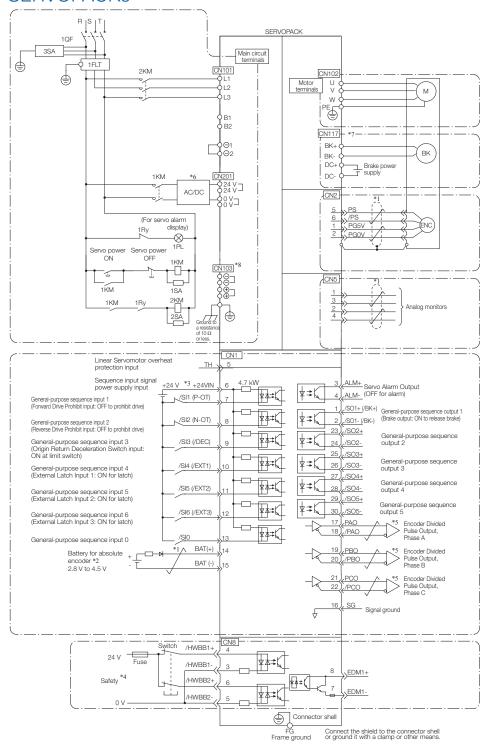
  17. The CN117 connector is only used for SERVOPACKs with built-in Servomotor brake control, SGD7S-ocoDooB026F64 and SGD7W-ocoDooB026.

  18. If using these terminals, contact your YASKAWA representative.

  19. The CN115 Dynamic Brake Connector is only for SGD7S-1R9D up to -170D.

# System Configurations with 6kW and more

#### SGD7S Single-axis MECHATROLINK-III Reference **SERVOPACKs**





- 2. Connect these when using an absolute encoder. If the Encoder Cable with a Battery Case is connected, do not connect a backup battery.

  3. The 24-VDC power supply is not provided by Yaskawa. Use a 24-VDC power supply with double insulation or reinforced insulation.

  4. Refer to the manual if you use a safety function device. If you do not use the safety function, insert the Safety Jumper Connector (provided as an accessory) into CN8 when you use the SERVOPACK.

  5. Always use line receivers to receive the output signals.

  6. Use an SELV-compliant power supply according to EN/IEC 60950-1 to input 24-VDC to the control power supply input terminals.

  7. The CN117 connector is only used for SERVOPACKs with built-in Servomotor brake control, SGD7S-oooDooB026F64 and SGD7W-oooDooB026.

  78. If using these terminals, contact your YASKAWA representative.

#### Cables for SERVOPACKs



1. Use the cable specified by YASKAWA for the computer cable. Operation may not be dependable with any other cable.

Refer to the manual for the following information. Cable dimensional drawings and cable connection specifications.

Order numbers and specifications of individual connectors for cables. Sigma-7-Series AC Servo Drive Peripheral Device Selection Manual.

Nam	e	Length (L)	Order Number	Appearance
Analog Moni	Analog Monitor Cable		JZSP-CA01-E	
	Digital Operator (including 1 m cable)		JUSP-OP05A-1-E	
Digital Opera	itor Cable	0.3 m	JZSP-CVS07-A3-E <sup>*2</sup>	
Computer	· Cable	2.5 m	JZSP-CVS06-02-E	
		1 m	JZSP-CVH03-01-E-G#	, L ,
Safety Function Device	Cables with Connectors*1	3m	JZSP-CVH03-03-E-G#	三••••••
Cable	Connecto	or Kit <sup>*2</sup>	Contact Tyco Electronics Japan Product name: Industrial Mini I/O Model number: 2013595-1	G.K. D D-shape Type 1 Plug Connector Kit
EtherC PROFIN	MECHATROLINK-III EtherCAT PROFINET Communications Cables*3		CM3R□M0-00P2-E CM3R□M0-00P5-E JZSP-CM3R□M0-01-E JZSP-CM3R□M0-05-E JZSP-CM3R□M0-10-E JZSP-CM3R□00-20-E JZSP-CM3R□00-30-E JZSP-CM3R□01-40-E JZSP-CM3R□01-50-E	L =•中國口 [][[]][[]]

- When using the safety function, connect this cable to the safety devices.
- Even when not using the safety function, use SERVOPACKs with the Safe Jumper Connector (model: JZSP-CVH05-E) connected.
- Use the connector kit when you make cables yourself.
- This cable is available in two variants. The order number for these cables differs at the marked  $\square$ , an "R" at this place is used for Cables with RJ45 Connectors on both ends, while an "M" is used for Cables with RJ45 Connector on One End and IMI Connector on the other End. "M" Variant not available for PROFINET cables. \*3.

#### Motor Connection Shielding Clamp

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

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

# SGD7W Dual Axis

# Model Designation

### **Dual Axis Amplifier**



1st 3rd digit - Maximum Applicable Motor Capacity				
Code	Specification			
Three-	phase, 400 V			
2R6	2 × 0.75 kW			
5R4 2 × 1.5 kW				

4th dig	jit - Voltage	
Code	Specification	
D	400 V AC	

5th + 6th digit - Interface			
Code	Specification		
A0	EtherCAT communication reference		
30	MECHATROLINK-III, RJ45 communication reference		

7th d	ligit - Design Revision Order
В	Standard Model

	l0th digit - are Options Specificatior	ıs			
Code	Code Specification Applicable Models				
None	Without Options	All models			
026*	With relay for holding brake	All models			

Bolded options are considered standard warehouse products.

 $<sup>^{\</sup>star}$  For specification of the internal brake relay, please refer to the hardware manual of the amplifier.

# Ratings and Specifications

### Ratings

#### Three-phase, 400 V AC

Model SGD7W-			2R6D	5R4D		
Maximum Applicable Motor Capacity per Axis [kW]			0.75	1.5		
Continuous Outpu	it Current per Axis	[A]	2.6	5.4		
Instantaneous Max	ximum Output Cur	rent per Axis [A]	8.5	14		
Main Circuit	Power Supply			Three-phase, 380 VAC to 480 VAC, -15 % to +10 %, 50 Hz/60 Hz		
	Input Current [A]	*	4.4	8.6		
Control	Power Supply		24 V DC ±15 %			
CONTROL	Input C	Current [A]*	1.2			
Power Supply Cap	pacity [kVA]*		3.5	6.8		
	Main Circuit Power Loss [W]		65.4	108.6		
Power Loss*	Control Circuit P	ower Loss [W]	21			
Power Loss	Built-in Regenera	ative Resistor Power Loss [W]	28	28		
	Total Power Loss [W]		114.4	157.6		
	Built-In	Resistance $[\Omega]$	43	43		
Regenerative Resistor	Regenerative Resistor	Capacity [W]	140	140		
	Minimum Allowable External Resistance $[\Omega]$		43	43		
Overvoltage Category				III		

<sup>\*</sup> This is the net value at the rated load.

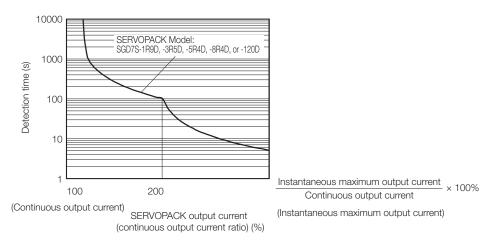
#### 540 V DC

Model SGD7W-		2R6D	5R4D
Maximum Applic	able Motor Capacity per Axis [kW]	0.75	1.5
Continuous Outp	out Current per Axis [A]	2.6	5.4
Instantaneous M	aximum Output Current per Axis [A]	8.5	14
Main Circuit	Power Supply	513 VDC to 648 VDC, -15 % to +10 %	
	Input Current [A]*	5	11
Control	Power Supply	24 V DC ±15 %	
Control	Input Current [A]*	1.2	
Power Supply Ca	apacity [kVA]*	3.5	6.8
	Main Circuit Power Loss [W]	47.4	90.6
Power Loss*	Control Circuit Power Loss [W]	21	
	Total Power Loss [W]	68.4	111.6
Overvoltage Category		I	II

<sup>\*</sup> 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 within the continuous duty zone of the torque-motor speed characteristic of the Servomotor.

## Specifications using EtherCAT Communication Reference

Item			Specification
Control Method			IGBT-based PWM control, sine wave current drive
With Rotary Servomotor		omotor	Serial encoder: 24 bits (incremental encoder/absolute encoder)
Feedback	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 Te	emperature	-5°C to 55°C (60°C with derating)
	Storage Temperat	ture	-20°C to 85°C
	Surrounding Air H	lumidity	95% relative humidity max. (with no freezing or condensation)
	Storage Humidity	,	95% relative humidity max. (with no freezing or condensation)
	Vibration Resistar	nce	4.9 m/s <sup>2</sup>
Environmental	Shock Resistance		19.6 m/s <sup>2</sup>
Environmental Conditions	Degree of Protect	ion	IP10
Conditions	Pollution Degree		<ul> <li>Must be no corrosive or flammable gases.</li> <li>Must be no exposure to water, oil, or chemicals.</li> <li>Must be no dust, salts, or iron dust.</li> </ul>
	Altitude		1,000 m or less (above 1,000 m with derating)
	Others		Do not use the SERVOPACK in the following locations: Locations subject to static electricity
Applicable Standards			noise, strong electromagnetic/magnetic fields, or radioactivity  Refer to the section Compliance with UL Standards, EU Directives, and Other Safety Standards (in Combination with SERVOPACK).
Mounting			Base-mounted
3	Speed Control Ra	inge	1:5,000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)
			±0.01 % of rated speed max. (for a load fluctuation of 0 % to 100 %)
	Coefficient of Spe	ed Fluctuation*1	0% of rated speed max. (for a voltage fluctuation of ± 10%)
Performance			±0.1 % of rated speed max. (for a temperature fluctuation of 25 °C ± 25 °C)
	T 0 1 1D		
	Torque Control Pr	ecision (Repeatability)	±1%
	Soft Start Time Se	etting	0s to 10s (Can be set separately for acceleration and deceleration.)
	Linear Servomoto Signal Input	r Overheat Protection	Number of input points: 1 Input voltage range: 0 V to +5 V
			Allowable voltage range: 24 VDC ±20 % Number of input points: 10 Input method: Sink inputs or source inputs Input Signals
	Sequence Input Signals	Input Signals that can be allocated	<ul> <li>P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals</li> <li>/Probe1 (Probe 1 Latch Input) signal</li> <li>/Probe2 (Probe 2 Latch Input) signal</li> <li>/Home (Home Switch Input) signal</li> </ul>
			<ul> <li>/P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals</li> <li>A signal can be allocated and the positive and negative logic can be changed.</li> </ul>
I/O Signals		Fixed Output	Allowable voltage range: 5 VDC to 30 VDC  Number of output points: 1  Output signal: ALM (Servo Alarm) signal
			Allowable voltage range: 5 VDC to 30 VDC  Number of output points: 6 (A photocoupler output (isolated) is used.)  Output Signals
	Sequence Output Signals	Output Signals that can be allocated	/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     /WKR (Brake) signal     /WARN (Warning) signal     /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.
		Interfaces	Digital Operator (JUSP-0P05A-1-E)
	RS-422A		
	Communications (CN502)	1: N Communications	Up to N = 15 stations possible for RS-422A port
Communications	(014002)	Axis Address Setting	Set with parameters.
	LIOD O	Interface	Personal Computer (with SigmaWin+)
	USB Communi- cations (CN7)	Communications	The software version of the SigmaWin+ must be version 7.11 or higher.
	Cations (CIVI)	Standard	Conforms to USB 2.0 standard (12 Mbps).

Continued on next page.

## SERVOPACKs SGD7W

Continued from previous page.

Item		Specification	
Displays/Indicators		CHARGE, PWR, RUN, ERR, and L/A (A and B) indicators, and two, one-digit	
	ations Setting Switches	seven-segment display  EtherCAT secondary address (S1 and S2), 16 positions	
	Applicable Communications Standards	IEC 61158 Type 12, IEC 61800-7 CiA402 Drive Profile	
	Physical Layer	100BASE-TX (IEEE 802.3)	
	Communications Connectors	CN6A (RJ45): EtherCAT signal input connector CN6B (RJ45): EtherCAT signal output connector	
	Cable	Category 5, 4 shielded twisted pairs  The cable is automatically detected with AUTO MDIX.	
	Sync Manager	SM0: Mailbox output, SM1: Mailbox input, SM2: Process data output, and SM3: Process data input	
Fthor CAT Communi	FMMU	FMMU 0: Mapped in process data output (RxPDO) area.  FMMU 1: Mapped in process data input (TxPDO) area.  FMMU 2: Mapped to mailbox status.	
EtherCAT Communications	EtherCAT Commands (Data Link Layer)	APRD, FPRD, BRD, LRD, APWR, FPWR, BWR, LWR, ARMW, and FRMW (APRW, FPRW, BRW, and LRW commands are not supported.)	
	Process Data	Assignments can be changed with PDO mapping.	
	Mailbox (CoE)	Emergency messages, SDO requests, SDO responses, and SDO information (TxPDO/RxPDO and remote TxPDO/RxPDO are not supported.)	
	Distributed Clocks	Free-Run Mode and DC Mode (Can be switched.)  Applicable DC cycles: 125 µs to 4 ms in 125-µs increments	
	Slave Information Interface	256 bytes (read-only)	
	Indicators	EtherCAT communications in progress: Link/Activity x 2 EtherCAT communications status: RUN x 1 EtherCAT error status: ERR x 1	
CiA402 Drive Profile		Homing Mode Profile Position Mode Interpolated Position Mode Profile Velocity Mode Profile Torque Mode Cyclic Synchronous Position Mode Cyclic Synchronous Velocity Mode Cyclic Synchronous Torque Mode Touch Probe Function Torque Limit Function	
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 Process	ing	Built-in  Refer to the catalog for details.	
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	/HWBB_A1, /HWWB_A2, /HWWB_B1 and /HWBB_B2: Base block signals for Power Modules	
Safety Functions	Output	EDM_A and EDM_B: Monitor the status of built-in safety circuits (fixed outputs).	
	Applicable Standards*2	ISO13849-1 PLe (Category 3), IEC61508 SIL3	
Applicable Option Mo	dules	Option Module Safety	

 $<sup>^{\</sup>star}2.$  Always perform risk assessment for the system and confirm that the safety requirements are met.

Linear Motors

# Specifications using MECHATROLINK-III Communication Reference

Sand encoder: 24 bits financemental incoder/absolute encoder/35  With Linear Servomotor  With Linear Servomotor  With Linear Servomotor  Surrounding Air Temperature  Scrope Hendry  Surrounding Air Temperature  Scrope Hendry  Surrounding Air Hamidity  Strong Hendry  Surrounding Air Hamidity  Strong Hendry  Vibration Resistance  The Strong Hendry	Item			Specification
Feedbasck  With Union Servomotor  Surrounding Air Temperature  Scrope Temperature  Temperature  Scrope Temperature  Scrope Temperature  Temperature  Temperature  Temperature  Scrope Temperature  Scrope Temperature  Scrope Temperature  Temperature  Temperature  Temperature  Scrope Temperature  Scrope Temperature  T	Control Method			IGBT-based PWM control, sine wave current drive
Incremental linear encoder. (The signal resolution depends on the incremental linear encoder. (The signal resolution depends on the incremental linear encoder. (The signal resolution depends on the incremental linear encoder. Serial Converter Unit.)   Surcounding Air Funndity			omotor	
Storage Temperature   -0.0°C to 85°C   Service	Feedback	With Linear Servo	motor	
Surrounding Air Humidity Storage Putterly Vibration Resistance Shock Resistance Shock Resistance Degree of Protection Plan Althude Others  Althude Others  Applicable Standards  Applicable Standards  Applicable Standards  Mounting  Speed Control Range  Coefficient of Speed Putterlation Performance  Performance  Coefficient of Speed Putterlation  Coefficient of Speed Putterlation  I ingust Signals  I ingust Signals that can be allocated  Fixed Output  Fixed Output  Fixed Output  Fixed Output  Residence  Communications  Com		Surrounding Air Temperature		-5°C to 55°C (60°C with derating)
Storage Humidity   Service and Profession   Service August   Service Aug		Storage Tempera	ture	-20°C to 85°C
Storage Humidity   Service and Profession   Service August   Service Aug				
Vibration Resistance   4.0 m/s²				
Environmental Conditions    Pollution Degree   Poll		,		, , ,
Adjusted Protection Pollution Degree Affitude Altitude Altitude Others Acpolicable Standards Mounting  Speed Control Range Speed Control Range  Speed Contro	Facility and so that	Shock Resistance	9	19.6 m/s <sup>2</sup>
Pollution Degree  Altitude  Others  Altitude  Others  Applicable Standards  Applicable S		Degree of Protect	ion	IP10
Do not use the SERVOPACK in the following locations: Locations autiject to static electricity noise, strong electromagnetic fields, or radiocate/bity   Refer to the section Compliance with UL Standards, EU Directives, and Other Safety Standards (no combanion with SERVOPACK).   Base-mounted   1:5,000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)   20,01% of rated speed max, (for a bed fluctuation of 0% to 100%)   Coefficient of Speed   70,000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor to stop.)   20,01% of rated speed max, (for a bed fluctuation of 0% to 100%)   Coefficient of Speed   70,000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor Order of stop.)   20,01% of rated speed max, (for a bed fluctuation of 0% to 100%)   Coefficient of Speed   70,000 (At the rated torque, the lower limit of the speed control range must not cause the Servomotor Order of stop.)   20,01% of rated speed max, (for a bed fluctuation of 0% to 100%)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   21%   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   21%   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a temperature fluctuation of 25°C ± 25°C)   Coefficient of Speed max, (for a	Conditions	Pollution Degree		<ul><li>Must be no corrosive or flammable gases.</li><li>Must be no exposure to water, oil, or chemicals.</li></ul>
Applicable Standards  Applicable Standards  Applicable Standards  Applicable Standards  Befer to the section Compliance with UL Standards, EU Directives, and Other Safety Standards (in Combination with SERVOPACK).  Base-mounted    Speed Control Range		Altitude		1,000 m or less (above 1,000 m with derating)
Mounting  Speed Control Range  Coefficient of Speed Puctuation*  Forgue Control Precision (Ricpeatability)  Soft Start Time Setting  Linear Service Covernation and deceleration.)  Signal Input  Squals  Sequence Input Signals  Fixed Output  Fixed Output  Fixed Output  Fixed Output  Signals  Fixed Output  Signals  A signal can be allocated  Sequence Output Signals  Output Signals  A signal can be allocated  Sequence Output Signals  Output Signals  Interfaces  Communications  Fixed Communications  (No. )  Special Control Range  Speed Control Range  Speed Control Range  Speed Control Range  15,5000 (At the rated torque, the lower limit of the speed control range must not cause the Service		Others		noise, strong electromagnetic/magnetic fields, or radioactivity
Speed Control Range		<b>S</b>		(in Combination with SERVOPACK).
Coefficient of Speed   2-0.01 % of rated speed max. (for a load fluctuation of 0 % to 100 %)	Mounting			
Communications  Communications		Speed Control Ra	ange	Servomotor to stop.)
Performance  Fluctuation*  Torque Control Precision (Repeatability)  Soft Start Time Setting  Linear Servomotor Overheat Protection Signal Input  Linear Servomotor Overheat Protection Signal Input  Sequence Input Signals  Input Signals that can be allocated  Fixed Output  Fixed Output  Sequence Output Signals  Output Signals  Output Signals that can be allocated  Fixed Output  Sequence Output Signals  Output Signals  Output Signals  Now Poor Circhovard Drive Prohibity and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse External Torque Limit) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse External Torque Limit) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse External Torque Limit) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) signals  - P-OT (Forward Drive Prohibity) and N-OT (Reverse Drive Prohibity) sig		Coofficient	and .	±0.01% of rated speed max. (for a load fluctuation of 0% to 100%)
Torque Control Precision (Repeatability)  Soft Start Time Setting Unear Servomotor Overheat Protection Signal Input  Sequence Input Signals  Input Signals that can be allocated  Fixed Output  Fixed Output  Output Signals  Output Signals  Output Signals  Output Signals  Output Signals  Output Signals  Allowable voitage range: 5 V to + 5 V Allowable voitage range: 24 WDC ± 20 % Number of input points: 10 Input wortened: Sink inputs or source inputs Input signals  - /ECT (Origin Return Deceleration Switch) signal  - /ECT (Origin Return Deceleration Switch) signal  - /ECT (Forward Drive Prohibity) and Nr-CL (Reverse External Torque Limit) signals  - /P-DET (Potarrity Detection) signal  - Allowable voitage range: 5 VDC to 30 VDC Number of input points: 1 Output signals  - /P-DET (Potarrity Detection) signal Allowable voitage range: 5 VDC to 30 VDC Number of output points: 0 Output Signals  - /OCIN (Postitioning Completion) signal - /-/CIN (Rosation Detection) signal - /-/CIN (Rosation Detection) signal - /-/SIN (Serake) signal - /-/SIN (Serake) signal - /-/SIN (Serake) signal - /-/SIN (Warning) signal - /-/-/-/-/-/-//			eed	0% of rated speed max. (for a voltage fluctuation of $\pm$ 10%)
Torque Control Precision (Repeatability) Soft Start Time Setting Union Servomotor Overheat Protection Signal Input  Sequence Input Signals  Input Signals that can be allocated  Fixed Output  Signals  Fixed Output  Signals  Fixed Output  Signals  Sequence Output Signals  Allowable voltage range: 5 WDC to 30 WDC Number of output points: 1 Output signal Allowable voltage range: 5 WDC to 30 VDC Number of output points: 1 Output signals All M (Servo Alarm) signal Allowable voltage range: 5 WDC to 30 VDC Number of output points: 1 Output signals All M (Servo Alarm) signal Allowable voltage range: 5 WDC to 30 VDC Number of output points: 6 Ap hotocoupler output points: 1 Output signals  Output Signals  Output Signals  Output Signals  Allowable voltage range: 5 WDC to 30 VDC Number of output points: 6 Ap hotocoupler output points: 6 Applead Applead Applead Applead Applead Applead Applead A	Performance	Fluctuation		+0.1 % of rated speed max. (for a temperature fluctuation of 25 °C + 25 °C)
Soft Start Time Setting			recision	
Linear Servomotor Overheat Protection Signal Input  Linear Servomotor Overheat Protection Signal Input  Signal Input  Sequence Input Signals  Input Signals that can be allocated  Input Signals that can be allocated  Input Signals  Input Signals that can be allocated  Input Signals  Input Signals that can be allocated  Input Signals  Input Signals that can be allocated and the positive and negative logic can be changed. Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output Signals  Sequence Output Signals  Output Signals that can be allocated and the positive and negative logic can be changed. Allowable voltage range: 5 VDC to 30 VDC Number of output points: 6 (A photocoupler output (isolated) is used.) Output Signals  - //-CMP (Speard Coincidence Detection) signal - //-CMP (Speard Coincidence Detection) signal - //-CMP (Speard Coincidence Detection) signal - //-CMP (Speard Initt Detection) signal - //CMP (Speard Initt Detection) signal - //			ettina	Os to 10s (Can be set separately for acceleration and deceleration.)
Signal input   Input voltage range: 0 V to +5 V			O	
Allowable voltage range: 24 VDC ± 20 % Number of input points: 10 Input method: Sink inputs or source inputs Input Signals  /DEC (Origin Return Deceleration Switch) signal  /DEXT1 to /EXT3 (External Latch Input 1 to 3) signals  /DEC (Input method: Sink inputs or source inputs Input Signals  /DEC (Origin Return Deceleration Switch) signal  /PO-OT (Forward External Torque Limit) and /N-OT (Reverse External Torque Limit) signal  A signal can be allocated and the positive and negative logic can be changed.  NULT (Speed Limit Detection) signal  /MEAR (Near) signal  /MEAR (Ne				· ·
Sequence Input   Signals   Input Signals that can be allocated   Input Signals   Input Signa		,		
Input Signals   Sequence Input   Signals   Input Signals   I				
Sequence Input Signals that can be allocated   P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals				
Application   Sequence   Sequence   Sequence   Output Signals that can be allocated   Potential   Signals   Potential   Pote				, ,
A signal can be allocated and the positive and negative logic can be changed.  Allowable voltage range: 5 VDC to 30 VDC  Number of output points: 1  Output signal: ALM (Servo Alarm) signal  Allowable voltage range: 5 VDC to 30 VDC  Number of output points: 6  (A photocoupler output (isolated) is used.)  Output Signals  Output Signals that can be allocated  Output Signals  Output Signals that can be allocated  Output Signals  Output Signal  Output				<ul> <li>/EXT1 to /EXT3 (External Latch Input 1 to 3) signals</li> <li>P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals</li> <li>/P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals</li> </ul>
Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 Output signal: ALM (Servo Alarm) signal Allowable voltage range: 5 VDC to 30 VDC Number of output points: 6 (A photocoupler output (sicolated) is used.) Output Signals  Output Signals that can be allocated  Output Signals  Output Signals that can be allocated  Output Signals  Output				
Fixed Output    Sequence   Output Signals   Sequence   Output Signals   Allowable voltage range: 5 VDC to 30 VDC   Number of output points: 6   (A photocoupler output (isolated) is used.)   Output Signals   V-CMP (Speed Coincidence Detection) signal   V-MCN (Rotation Detection) signal   V-MCN (Rotation Detection) signal   V-MCN (Rotation Detection) signal   V-MCN (Warning) signal   V				
Output signal: ALM (Servo Alarm) signal Allowable voltage range: 5 VDC to 30 VDC Number of output points: 6 (A photocoupler output (isolated) is used.) Output Signals  - /COIN (Positioning Completion) signal - /V-CMP (Speed Coincidence Detection) signal - /C-CMP (Speed Coincidence Detection) signa	1/0.01		Fixed Output	
Sequence Output Signals Output Signals that can be allocated  Output Signals that can be allocated  Output Signals  Output Signals that can be allocated  Output Signals that can be allocated Detection) signal  Output Signals  Output Signals that can be allocated Detection) signal  Output Signals  Output Signals that can be allocated Detection) signal  Output Signals  Output Signals  Output Signals that can be allocated Detection) signal  Output Signals  Output Signals  Output Signals that can be allocated Detection) signal  Output Detection) signal  Output Detection) signal  Output Detection) signal  Output Signals  Output Signal  Output Signal	I/O Signals			Output signal: ALM (Servo Alarm) signal
Sequence Output Signals  Output Signals that can be allocated  Output Signals that can be allocated that the positive and negative logic can be changed.  Output Signals that can be allocated that can be allocated and the positive and negative logic can be changed.  Output Signals that can be allocated and the positive and negative logic can be changed.  Output Signals that can be allocated and the positive and negative logic can be changed.  Output Signals that can be allocated and the positive and negative logic can be changed.  Digital Operator (JUSP-OP05A-1-E)  Output Signals that can be allocated and the positive and negative logic can be changed.  Digital Operator (JUSP-OP05A-1-E)  Output Signals that can be allocated and the positive and negative logic can be changed.  Digital Operator (JUSP-OP05A-1-E)  Set with parameters.  Set with parameters.  Set with parameters.  Personal Computer (with SigmaWin+)  The software version of the SigmaWin+ must be version 7.11 or higher.  Conforms to USP 2 of standard (12 Mhos)				
Sequence Output Signals  Output Signals that can be allocated  Output Signals that can be allocated to //O-CMP (Speed Coincidence Detection) signal  //C-CMP (SPervo Ready) signal  //C-CMP (Speed Coincidence Detection) signal  //C-CMP (Speed Coincidence D				
Communications  Output signals that can be allocated  Output signals that can be allocated and the positive and negative logic can be changed.  Output signals that can be allocated limit Detection) signal  Output signals that can be allocated limit Detection) signal  Output signals that can be allocated limit Detection) signal  Output signal that can be allocated limit Detection) signal  Output signal  Output (Servo Ready) signal  Output (Servo Read				Output Signals  VCOIN (Positioning Completion) signal  V-CMP (Speed Coincidence Detection) signal
A signal can be allocated and the positive and negative logic can be changed.  RS-422A Communications (CN3)  Axis Address Setting USB Communications USB Communications USB Communications (CN7)  Interface Communications  Conforms to USB 2 0 standard (12 Mbps)  Conforms to USB 2 0 standard (12 Mbps)		output orginals		<ul> <li>/S-RDY (Servo Ready) signal</li> <li>/CLT (Torque Limit Detection) signal</li> <li>/VLT (Speed Limit Detection) signal</li> <li>/BK (Brake) signal</li> <li>/WARN (Warning) signal</li> </ul>
RS-422A Communications (CN3)  Communications				
Communications  Communications  Communications  Communications  Communications  Communications  Axis Address Setting  Set with parameters.  Personal Computer (with SigmaWin+)  The software version of the SigmaWin+ must be version 7.11 or higher.  Communications  Conforms to USB 2.0 standard (12 Mbps)		RS-422A	Interfaces	
Communications  (CN3)  Axis Address Setting  Set with parameters.  Personal Computer (with SigmaWin+)  The software version of the SigmaWin+ must be version 7.11 or higher.  Communications  Conforms to USB 2.0 standard (12 Mbps)			1: N Communications	Up to N = 15 stations possible for RS-422A port
USB Communications  USB Communications (CN7)  USB Communications (CN7)  Interface Personal Computer (with SigmaWin+) The software version of the SigmaWin+ must be version 7.11 or higher.  Conforms to USB 2.0 standard (12 Mbps)				
USB Communications (CN7)  The software version of the SigmaWin+ must be version 7.11 or higher.  Communications  Conforms to USB 2.0 standard (12 Mbps)	Communications			·
Conforms to USB2 (1 standard (12 Minns)				
				Conforms to USB 2.0 standard (12 Mbps).

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## SERVOPACKs SGD7W

Continued from previous page.

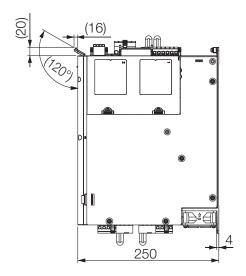
Item		Specification	
Displays/Indicators		CHARGE, PWR, CN, L1 and L2 indicators, and two, one-digit seven-segment display	
	Communications Protocol	MECHATROLINK-III	
MECHATROLINK-III Communications	Station Address Settings	03 to EF hex (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.	
	Extended Address Setting	Axis A: 00 hex, Axis B: 01 hex	
	Raud Rate	100 Mbps	
	Transmission Cycle	250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms)	
	Number of Transmission Bytes	32 or 48 bytes per station A DIP switch (S3) is used to select the number of transmission bytes.	
	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.)	
	Profile	MECHATROLINK-III standard servo profile	
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 Process	sing	Built-in Refer to the catalog for details.	
Overtravel (OT) Preve	ntion	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.	
Safety Functions	Inputs	/HWBB_A1, /HWWB_A2, /HWWB_B1 and /HWBB_B2: Base block signals for Power Modules	
	Output	EDM_A and EDM_B: Monitor the status of built-in safety circuits (fixed outputs).	
	Applicable Standards*2	ISO13849-1 PLe (Category 3), IEC61508 SIL3	
Applicable Option Modules		Option Module Safety	

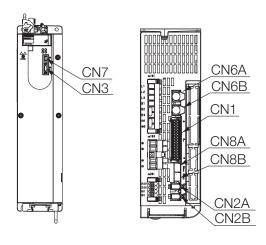
<sup>\*2.</sup> Always perform risk assessment for the system and confirm that the safety requirements are met.

# Front Cover Dimensions and Connector Specifications

The front cover dimensions and panel connector section are the same for all models. Refer to the following figures and table.

#### • Front Cover Dimensions and Connectors





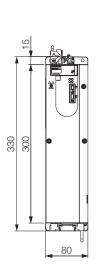
Unit: mm

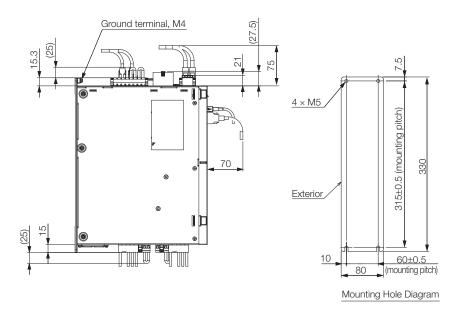
#### • Connector Specifications

Connector No.	Function	Model	YASKAWA Order Code	Number of Pins	Manufacturer
CN1	I/O Connector	DFMC1,5/15-ST-3,5-LRBK	JUSP-7CN001	30	Phoenix Contact
CN2A/CN2B	Encoder Connector Axis A Encoder Connector Axis B	-	JZSP-CMP9-1-E	6	Sumitomo 3M Ltd.
CN3	Digital Operator	-	-	14	Honda Tsushin Kogyo Co., Ltd
CN6A/CN6B	Fieldbus Connector	-		8	Tyco Electronics Japan G.K.
CN7	USB Connector for Sig- maWin	-	-	5	Tyco Electronics Japan G.K.
ONIOA	Safety Connector Kit	-	2013595-1	0	Tyco Electronics Japan G.K.
CN8A	Safety Jumper Connector	-	JZSP-CVH05-E	8	
CNIOD	Safety Connector Kit	-	2013595-1	0	Tyco Electronics Japan G.K.
CN8B	Safety Jumper Connector	-	JZSP-CVH05-E	8	
CN101	Main Power Connector	BLZ 7.62HP/08/180LR SN BK BX PRT	JUSP-7CN101	8	Weidmüller
CN102A/ CN102B	Motor Power Connector Axis A Motor Power Connector Axis B	BLZ 7.62IT/04/180MF4 SN BK BX PRT	JUSP-7CN102	4	Weidmüller
CN103	DC Power Input	BVZ 7.62IT/04/180MF3 SN BK BX PRT	JUSP-7CN103	4	Weidmüller
CN115A/ CN115B	Dynamic Brake Connector Axis A Dynamic Brake Connector Axis B	BLZ 7.62IT/03/180MF2 SN BK BX PRT	JUSP-7CN115	3	Weidmüller
CN117	Holding Brake Connector	BLF 5.08HC/04/180LR SN BK BX SO	JUSP-7CN117	4	Weidmüller
CN201	24 V Control Power Input	BLF 5.08HC/04/180LR SN OR BX SO	JUSP-7CN201	4	Weidmüller

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

#### Base-mounted SERVOPACKs



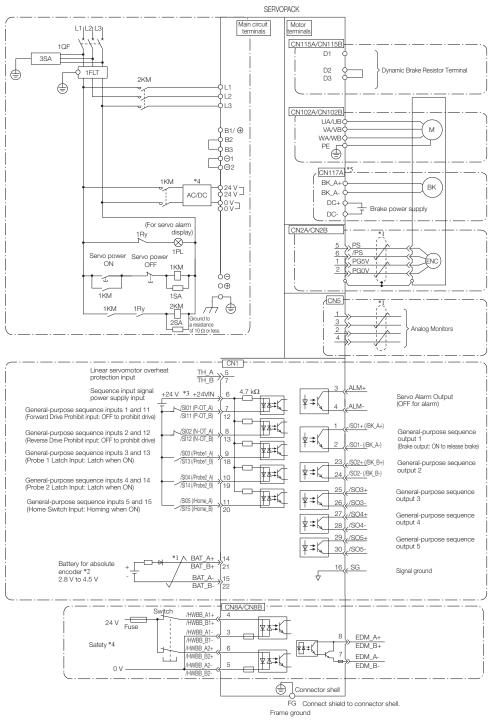


Approx. mass: 2R6D: 4.1 kg 5R4D: 4.3 kg

Unit: mm

# System Configurations up to 2×1.5 kW

# SGD7W Dual-axis EtherCAT Reference SERVOPACKs



<sup>\*1.</sup> represents twisted-pair wires.

Note: 1. You can use parameter settings to change some of the I/O signal allocations.

<sup>\*2.</sup> Connect these when using an absolute encoder. If the Encoder Cable with a Battery Case is connected, do not connect a backup battery.

<sup>\*3.</sup> The 24-VDC power supply is not provided by Yaskawa. Use a 24-VDC power supply with double insulation or reinforced insulation

<sup>\*4.</sup> Use an SELV-compliant power supply according to EN/IEC 60950-1 to input 24 VDC to the control power supply input terminals.

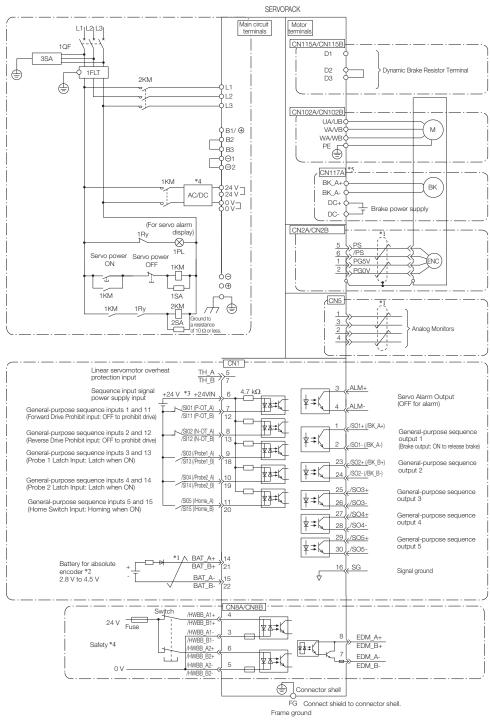
<sup>\*5.</sup> The CN117 connector is used for SERVOPACKs with built-in Servomotor brake control. SERVOPACKs without built-in Servomotor brake control do not have the CN117 connector.

<sup>2.</sup> 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.

<sup>3.</sup> Default settings are given in parentheses.

# System Configurations up to 2×1.5 kW

# SGD7W Dual-axis MECHATROLINK-III Reference SERVOPACKs



<sup>\*1.</sup> represents twisted-pair wires.

Note: 1. You can use parameter settings to change some of the I/O signal allocations.

<sup>\*2.</sup> Connect these when using an absolute encoder. If the Encoder Cable with a Battery Case is connected, do not connect a backup battery.

<sup>\*3.</sup> The 24-VDC power supply is not provided by Yaskawa. Use a 24-VDC power supply with double insulation or reinforced insulation

<sup>\*4.</sup> Use an SELV-compliant power supply according to EN/IEC 60950-1 to input 24 VDC to the control power supply input terminals.

<sup>\*5.</sup> The CN117 connector is used for SERVOPACKs with built-in Servomotor brake control. SERVOPACKs without built-in Servomotor brake control do not have the CN117 connector.

<sup>2.</sup> 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.

<sup>3.</sup> Default settings are given in parentheses.

Option Modules

#### Cables for SERVOPACKs



1. Use the cable specified by YASKAWA for the computer cable. Operation may not be dependable with any other cable.

Refer to the manual for the following information. Cable dimensional drawings and cable connection specifications.

Order numbers and specifications of individual connectors for cables. Sigma-7-Series AC Servo Drive Peripheral Device Selection Manual.

Name		Length (L)	Order Number	Appearance
Analog Monitor Cable		1 m	JZSP-CA01-E	
Digital Operator (including 1 m cable)		1 m	JUSP-OP05A-1-E	
Digital Operator Cable		0.3 m	JZSP-CVS07-A3-E <sup>*2</sup>	
Computer	Computer Cable		JZSP-CVS06-02-E	
	Cables with Connectors*1	1 m	JZSP-CVH03-01-E-G#	. L .
Safety Function Device		3 m	JZSP-CVH03-03-E-G#	三章類[1]
Cable	Connecto	or Kit*²	Contact Tyco Electronics Japan Product name: Industrial Mini I/0 Model number: 2013595-1	G.K. O D-shape Type 1 Plug Connector Kit
		0.2 m	CM3R□M0-00P2-E	
MECHATROLINK-III EtherCAT		0.5 m	CM3R□M0-00P5-E	
		1 m	JZSP-CM3R□M0-01-E	
		3 m	JZSP-CM3R□M0-03-E	<b>←</b>
		5 m 10 m	JZSP-CM3R□M0-05-E	
	PROFINET  Communications Cables*3		JZSP-CM3R□M0-10-E JZSP-CM3R□00-20-E	
Continunication	is Capies	20 m 30 m	JZSP-CM3R□00-20-E	
		40 m	JZSP-CM3R□01-40-E	
			JZSP-CM3R□01-50-E	
		50 m	5_5. O.H.O. 1_0 . 00 L	

- \*1. When using the safety function, connect this cable to the safety devices.
- Even when not using the safety function, use SERVOPACKs with the Safe Jumper Connector (model: JZSP-CVH05-E) connected.
- \*2. Use the connector  $\dot{\text{kit}}$  when you make cables yourself.
- This cable is available in two variants. The order number for these cables differs at the marked  $\square$ , an "R" at this place is used for Cables with RJ45 Connectors on both ends, while an "M" is used for Cables with RJ45 Connector on One End and IMI Connector on the other End. \*3.

### Motor Connection Shielding Clamp

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

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