Analog Voltage/Pulse Train Reference Type SERVOPACKs

SGDV-□□□□01
(For Rotary Servomotors)

SGDV-□□□□05
(For Linear Servomotors)

Model Designations

S G D V - R70 A 01 A 000 00 0

Σ-V Series SGDV SERVOPACK	1st+2nd+3rd digits	4th digit	5th+6th digits	7th digit	8th+9th+10th digits	11th+12th digits	13th digit

1st+2nd+3rd digits Current

Voltage	Code	Applicable Servomotor Max. Capacity kW
Single-phase 100 V	R70	0.05
	R90	0.1
	2R1	0.2
	2R8	0.4
Three-phase 200 V	R70*1	0.05
	R90*1	0.1
	1R6*1	0.2
	2R8*1	0.4
	3R8	0.5
	5R5*1	0.75
	7R6	1.0
	120*2	1.5
	180	2.0
	200	3.0
	330	5.0
	470	6.0
	550	7.5
	590	11
	780	15
Three-phase 400 V	1R9	0.5
	3R5	1.0
	5R4	1.5
	8R4	2.0
	120	3.0
	170	5.0
	210	6.0
	260	7.5
	280	11
	370	15

4th digit Power Supply Voltage

Code	Specifications
F	Single-phase 100 VAC
A	Three-phase 200 VAC
D	Three-phase 400 VAC

5th+6th digits Interface

Code	Specifications
01	Analog voltage/pulse train reference type (for rotary servomotors)
05	Analog voltage/pulse train reference type (for linear servomotors)

7th digit Design Revision Order

A, B…

8th+9th+10th digits Options (hardware)*4

Code	Specifications
000	Base-mounted (standard)
001	Rack-mounted*3
002	Varnished
003	Rack-mounted*3 and Varnished
008	Single-phase 200 VAC input (Model: SGDV-120A01A008000)
020	Dynamic brake (400 V SERVOPACKs only)

11th+12th digits Options (software)

Code	Specifications
00	Standard

13th digit Options (parameter)

Code	Specifications
0	Standard

∗1: These amplifiers can be powered with single or three-phase.
∗2: Single-phase 200 VAC SERVOPACKs are also available. (Model: SGDV-120A01A008000)
∗3: SERVOPACKs of 6 kW or more are duct-ventilated.
∗4: Multiple codes can be selected, but some combinations are not possible.
Note: If the option codes digits 8 to 13 are all zeros, they are omitted.

Features

- Unprecedented ease-of-use through cutting-edge technology
  New tuning-less function means no adjustment needed.
  Impressive load regulation with strengthened vibration suppression function.
- Slashed setup time
  Setup wizard function and wiring conformation function of engineering tool SigmaWin+ allows easy setup just by watching the monitor.
- High response characteristics at 1 kHz min.
  New advanced autotuning.
  Reduced positioning time through model following control, and smooth machine control enabled by vibration suppression function.

Ratings

Single-phase 100 V

SERVOPACK Model SGDV-□□□□	R70F	R90F	2R1F	2R8F
Applicable Servomotor Max. Capacity kW	0.05	0.1	0.2	0.4
Continuous Output Current Arms	0.66	0.91	2.1	2.8
Max. Output Current Arms	2.1	2.9	6.5	9.3
Regenerative Resistors	None or external			
Main Circuit	Single-phase 100 to 115 VAC+10% to -15% 50/60 Hz			
Control Circuit	Single-phase 100 to 115 VAC+10% to -15% 50/60 Hz			

Single-phase 200 V

SERVOPACK Model SGDV-□□□□	R70A	R90A	1R6A	2R8A	5R5A	120A*
Applicable Servomotor Max. Capacity kW	0.05	0.1	0.2	0.4	0.75	1.5
Continuous Output Current Arms	0.66	0.91	1.6	2.8	5.5	11.6
Max. Output Current Arms	2.1	2.9	5.8	9.3	16.9	28
Regenerative Resistors	None or external				Built-in or external	
Main Circuit*	Single-phase 200 to 230 VAC+10% to -15% 50/60 Hz					
Control Circuit*	Single-phase 200 to 230 VAC+10% to -15% 50/60 Hz					

*: The rated voltage is 220 to 230 VAC for the SGDV-120A01A008000 SERVOPACK.

Three-phase 200 V

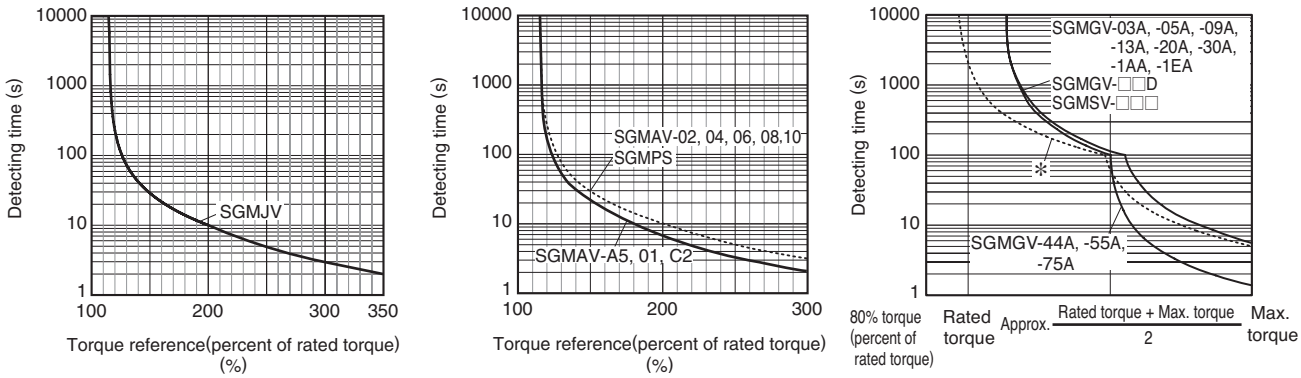
SERVOPACK Model SGDV-□□□□	R70A	R90A	1R6A	2R8A	3R8A	5R5A	7R6A	120A	180A	200A	330A	470A	550A	590A	780A
Applicable Servomotor Max. Capacity kW	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	6	7.5	11	15
Continuous Output Current Arms	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9	46.9	54.7	58.6	78
Max. Output Current Arms	2.1	2.9	5.8	9.3	11	16.9	17	28	42	56	84	110	130	140	170
Regenerative Resistors	None or external				Built-in or external							External			
Main Circuit	Three-phase 200 to 230 VAC+10% to -15% 50/60 Hz														
Control Circuit	Single-phase 200 to 230 VAC+10% to -15% 50/60 Hz														

Three-phase 400 V

SERVOPACK Model SGDV-□□□□	1R9D	3R5D	5R4D	8R4D	120D	170D	210D	260D	280D	370D
Applicable Servomotor Max. Capacity kW	0.5	1.0	1.5	2.0	3.0	5.0	6	7.5	11	15
Continuous Output Current Arms	1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.7	28.1	37.2
Max. Output Current Arms	5.5	8.5	14	20	28	42	55	65	70	85
Regenerative Resistors	Built-in or external						External			
Main Circuit	Three-phase 380 to 480 VAC+10% to -15% 50/60 Hz									
Control Circuit	24 VDC ±15%									

Note: The entire over voltage category is Ⅲ.

●SERVOPACK Overload Characteristics



Note: Overload characteristics shown above do not guarantee continuous duty of 100% or more output. Use a servomotor with effective torque within the continuous duty zone of *Torque-Motor Speed Characteristics*.

*: The dotted line indicates the characteristics of a combination of SGDV-200A SERVOPACKs and SGMGV-30A servomotors.

Specifications

Items			Specifications	
Control Method			IGBT PWM control, sine-wave driven	
Feedback	Rotary Servomotors		Serial encoder: 13-bit (incremental encoder) : 17-bit (incremental/absolute encoder) : 20-bit (incremental/absolute encoder)	
	With Linear Servomotors		Absolute linear scale (The signal resolution varies depending on the absolute linear scale.) Incremental linear scale (The signal resolution varies depending on the incremental linear scale or serial converter unit.)	
Operating Conditions	Ambient Temperature		0 to +55°C	
	Storage Temperature		−20 to +85°C	
	Ambient Humidity		90%RH or less	With no freezing or condensation
	Storage Humidity		90%RH or less	
	Vibration Resistance		4.9 m/s²	
	Shock Resistance		19.6 m/s²	
	Protection Class		IP10	An environment that satisfies the following conditions. ・Free of corrosive or flammable gases ・Free of exposure to water, oil, or chemicals ・Free of dust, salts, or iron dust
	Pollution Degree		2	
	Altitude		1000 m or less	
	Others		Do not use SERVOPACKs in the following locations: ・Locations subject to static electricity noise, strong electromagnetic/magnetic fields, radioactivity	
Applicable Standards			UL508C (E147823) EN50178, EN55011/A2 group1 classA, EN61000-6-2, EN61800-3, EN61800-5-1, EN954-1, IEC61508-1 to 4	
Mounting			Standard: Base-mounted Optional: Rack-mounted, Duct-ventilated	
Performance	Speed Control Range		1:5000 (The lower limit of the speed control range must be lower than the point at which the rated torque does not cause the servomotor to stop.)	
	Speed Regulation*1	Load Fluctuation	0% to 100% load: ±0.01% max. (at rated speed)	
		Voltage Fluctuation	Rated voltage: ±10% : 0% (at rated speed)	
		Temperature Fluctuation	25±25°C : ±0.1% max. (at rated speed)	
	Torque Control Tolerance (Repeatability)		±1%	
	Soft Start Time Setting		0 to 10 s (can be set individually for acceleration and deceleration.)	
Communications	RS-422A Communications	Interface	Digital operator (JUSP-OP05A-1-E), personal computer (can be connected with SigmaWin+)	
		1:N communications	RS-422A port: N=15 max. available	
		Axis address setting	Set by parameters	
	USB Communications	Interface	Personal computer (can be connected with SigmaWin+.)	
		Communications Standard	Compliant with USB1.1 standard (12 Mbps)	
Display			CHARGE indicator	
Analog Monitor			Number of points: 2 Output voltage: ±10 VDC (linearity effective range ±8 V) Resolution: 16 bit Accuracy: ±20 mV (Typ) Max. output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)	
Dynamic Brake (DB)			Activated when a servo alarm or overtravelling (OT) occurs, or when the power supply for the main circuit or servomotor is OFF.	
Regenerative Processing			Included (For more information, refer to the previous page.)	
Overtravelling (OT) Prevention			Dynamic brake stop at P-OT or N-OT, deceleration to a stop, or free run to a stop	
Protective Functions			Overcurrent, Overvoltage, low voltage, overload, regeneration error , etc.	
Utility Functions			Gain adjustment, alarm history, JOG operation, origin search, etc.	
Safety Functions		Input	/HWBB1, /HWBB2: Baseblock signal for power module	
		Output	EDM1: Status monitor (fixed output) of built-in safety circuit	
		Applicable Standards*2	EN954 category 3, IEC61508 SIL2	
Option Module			Fully-closed Module	

*1: Speed regulation is defined as follows:

$$\text{Speed regulation} = \frac{\text{No-load motor speed} - \text{Total load motor speed}}{\text{Rated motor speed}} \times 100\%$$

The motor speed may change due to voltage fluctuation or temperature fluctuation.
The ratio of speed changes to the rated speed represent speed regulation due to voltage and temperature fluctuations.

*2: Perform risk assessment for the system and confirm that the safety requirements for the standards are fulfilled before using the HWBB function.

Specifications

●Rotary Servomotors

Items				Specifications	
I/O Signal	Encoder Output Pulses			Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available.	
	Sequence Input		Fixed Input	SEN signal	
			Input Signals which can be allocated	Number of Channels	7 channels
				Functions	・Servo ON (/S-ON) ・Internal set speed selection (/SPD-D, /SPD-A, /SPD-B) ・Proportional control (/P-CON) ・Forward run prohibited (P-OT), reverse run prohibited (N-OT) ・Control selection (/C-SEL) ・Zero clamping (/ZCLAMP) ・Alarm reset (/ALM-RST) ・Reference pulse inhibit (/INHIBIT) ・Forward external torque limit (/P-CL), reverse external torque limit (/N-CL) ・Gain selection (/G-SEL) Positive and negative logic can be changed.
	Sequence Output		Fixed Output	Servo alarm (ALM), alarm code (ALO1, ALO2, ALO3) outputs	
			Output Signals which can be allocated	Number of Channels	3 channels
				Functions	・Positioning completion (/COIN) ・Speed limit detection (/VLT) ・Speed coincidence detection (/V-CMP) ・Brake (/BK) ・Rotation detection (/TGON) ・Warning (/WARN) ・Servo ready (/S-RDY) ・Near (/NEAR) ・Torque limit detection (/CLT) Positive and negative logic can be changed.
Panel Operator			Display Unit	Five 7-segment LEDs	
			Switch	Four push switches	
Torque Control	Input Signals		Reference Voltage	・Max. input voltage: ±12 V (forward torque reference with positive reference) ・Factory setting: 3 VDC at rated torque (Input gain setting can be changed.)	
			Input Impedance	About 14 kΩ	
			Circuit Time Constant	16 μs	
Speed Control	Soft Start Time Setting			0 to 10 s (can be set individually for acceleration and deceleration.)	
	Input Signals		Reference Voltage	・Max. input voltage: ±12 V (forward speed reference with positive reference) ・Factory setting: 6 VDC at rated speed (Input gain setting can be changed.)	
			Input Impedance	About 14 kΩ	
			Circuit Time Constant	30 μs	
	Internal Set Speed Control		Rotation Direction Selection	With P control signal	
			Speed Selection	With forward/reverse external torque limit signal (speed 1 to 3 selection). Servomotor stops or another control method is used when both are OFF.	
Position Control	Feedforward Compensation			0 to 100%	
	Positioning Completed Width Setting			0 to 1073741824 reference units	
	Input Signals	Reference Pulse	Type	Select one of them: Sign + pulse train, CW + CCW pulse train, or two-phase pulse train with 90° phase differential	
			Form	For line driver, open collector	
			Max. Input Pulse Frequency*	Line driver Sign + pulse train, CW + CCW pulse train: 4 Mpps Two-phase pulse train with 90° phase differential:1 Mpps Open Collector Sign + pulse train, CW + CCW pulse train: 200 kpps Two-phase pulse train with 90° phase differential: 200 kpps	
		Clear Signal		Position error clear For line driver, open collector	

*: If the maximum reference frequency exceeds 1 Mpps, use a shielded cable for I/O signals and ground both ends of the shield. Connect the shield at the SERVOPACK to the connector shell.

Specifications

●Linear Servomotors

Items				Specifications	
I/O Signal	Encoder Output Pulses			Phase A, phase B, phase C: line driver output The number of dividing pulse: Any setting ratio is available.	
	Sequence Input		Fixed Input	SEN signal	
			Input Signals which can be allocated	Number of Channels	7 channels
				Functions	・Servo ON (/S-ON) ・Internal set speed selection (/SPD-D, /SPD-A, /SPD-B) ・Proportional control (/P-CON) ・Forward run prohibited (P-OT), Reverse run prohibited (N-OT) ・Control selection (/C-SEL) ・Zero clamping (/ZCLAMP) ・Alarm reset (/ALM-RST) ・Reference pulse inhibit (/INHIBIT) ・Forward external force limit (/P-CL), Reverse external force limit (/N-CL) ・Gain selection (/G-SEL) ・Polarity detection (P-DET) Positive and negative logic can be changed.
	Sequence Output		Fixed Output	Servo alarm (ALM), alarm code (ALO1, ALO2, ALO3) outputs	
			Output Signals which can be allocated	Number of Channels	3 channels
				Functions	・Positioning completion (/COIN) ・Speed limit detection (/VLT) ・Speed coincidence detection (/V-CMP) ・Brake (/BK) ・Servomotor movement detection (/TGON) ・Warning (/WARN) ・Servo ready (/S-RDY) ・Near (/NEAR) ・Force limit detection (/CLT) Positive and negative logic can be changed.
Panel Operator			Display Unit	Five 7-segment LEDs	
			Switch	Four push switches	
Force Control	Input Signals		Reference Voltage	・Max. input voltage: ±12 V (forward force reference with positive reference) ・Factory setting: 3 VDC at rated force (Input gain setting can be changed.)	
			Input Impedance	About 14 kΩ	
			Circuit Time Constant	16 μs	
Speed Control	Soft Start Time Setting			0 to 10 s (can be set individually for acceleration and deceleration.)	
	Input Signals		Reference Voltage	・Max. input voltage: ±12 V (forward speed reference with positive reference) ・Factory setting: 6 VDC at rated speed (Input gain setting can be changed.)	
			Input Impedance	About 14 kΩ	
			Circuit Time Constant	30 μs	
	Internal Set Speed Control		Movement Direction Selection	With P control signal	
			Speed Selection	With forward/reverse external force limit signal (speed 1 to 3 selection). Servomotor stops or another control method is used when both are OFF.	
Position Control	Feedforward Compensation			0 to 100%	
	Positioning Completed Width Setting			0 to 1073741824 reference units	
	Input Signals	Reference Pulse	Type	Select one of them: Sign + pulse train, forward + reverse pulse train, two-phase pulse train with 90° phase differential	
			Form	For line driver, open collector	
			Max. Input Pulse Frequency*	Line driver Sign + pulse train, forward + reverse pulse train: 4 Mpps Two-phase pulse train with 90° phase differential:1 Mpps Open Collector Sign + pulse train, forward + reverse pulse train: 200 kpps Two-phase pulse train with 90° phase differential: 200 kpps	
		Clear Signal		Position error clear For line driver, open collector	

*: If the maximum reference frequency exceeds 1 Mpps, use a shielded cable for I/O signals and ground both ends of the shield.
Connect the shield at the SERVOPACK to the connector shell.

Power Supply Capacities and Power Losses

The following table shows SERVOPACK's power supply capacities and power losses at the rated output.

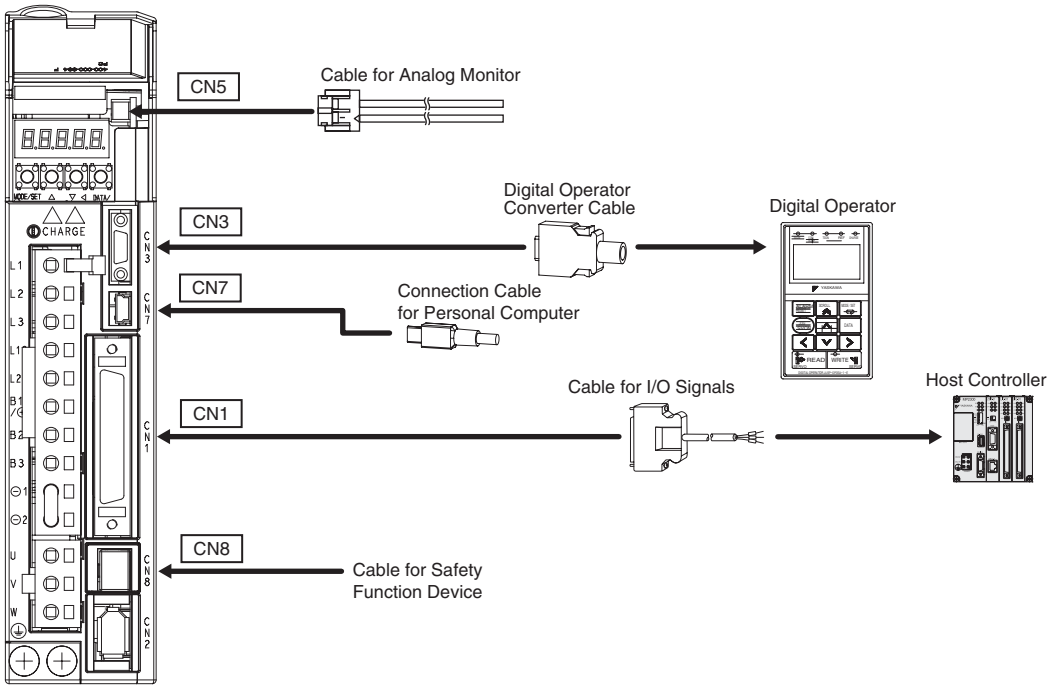
Main Circuit Power Supply	Applicable Servomotor Max. Capacity kW	SERVOPACK Model SGDV-	Power Supply Capacity kVA	Output Current Arms	Main Circuit Power Loss W	Regenerative Resistor Power Loss W	Control Circuit Power Loss W	Total Power Loss W
Signal-phase 100 V	0.05	R70F	0.2	0.66	5.4	—	17	22.4
	0.1	R90F	0.3	0.91	7.8			24.8
	0.2	2R1F	0.7	2.1	14.4			31.4
	0.4	2R8F	1.4	2.8	25.6			42.6
Single-phase 200 V	0.05	R70A	0.2	0.66	5.2	—	17	22.2
	0.1	R90A	0.3	0.91	7.4			24.4
	0.2	1R6A	0.7	1.6	13.7			30.7
	0.4	2R8A	1.2	2.8	24.9			41.9
	0.75	5R5A	1.9	5.5	52.7	8		77.7
	1.5	120A	4	11.6	68.2	10	22	100.2
Three-phase 200 V	0.05	R70A	0.2	0.66	5.1	—	17	22.1
	0.1	R90A	0.3	0.91	7.3			24.3
	0.2	1R6A	0.6	1.6	13.5			30.5
	0.4	2R8A	1	2.8	24.0			41.0
	0.5	3R8A	1.4	3.8	20.1	8		45.1
	0.75	5R5A	1.6	5.5	43.8			68.8
	1.0	7R6A	2.3	7.6	53.6			78.6
	1.5	120A	3.2	11.6	65.8	10	22	97.8
	2.0	180A	4	18.5	111.9	16		149.9
	3.0	200A	5.9	19.6	113.8			161.4
	5.0	330A	7.5	32.9	263.7	36	27	326.7
	6.0	470A	10.7	46.9	279.4	(180)*1	33	312.4
	7.5	550A	14.6	54.7	357.8	(350)*2		390.8
	11	590A	21.7	58.6	431.7		48	479.7
	15	780A	29.6	78	599.0			647.0
Three-phase 400 V	0.5	1R9D	1.1	1.9	24.6	14	21	59.6
	1.0	3R5D	2.3	3.5	46.1			81.1
	1.5	5R4D	3.5	5.4	71.3			106.3
	2.0	8R4D	4.5	8.4	77.9	28	25	130.9
	3.0	120D	7.1	11.9	108.7			161.7
	5.0	170D	11.7	16.5	161.1	36	24	221.1
	6.0	210D	12.4	20.8	172.7	(180) *3	27	199.7
	7.5	260D	14.4	25.7	218.6			245.6
	11	280D	21.9	28.1	294.6	(350) *4	30	324.6
	15	370D	30.6	37.2	403.8			433.8

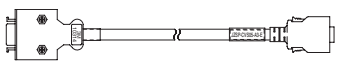
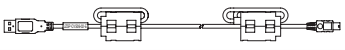
∗1: For the optional JUSP-RA04-E regenerative resistor unit.
∗2: For the optional JUSP-RA05-E regenerative resistor unit.
∗3: For the optional JUSP-RA18-E regenerative resistor unit
∗4: For the optional JUSP-RA19-E regenerative resistor unit.

Notes: 1 SGDV-R70F, -R90F, -2R1F, -2R8F, -R70A, -R90A, -1R6A, and -2R8A SERVOPACKs do not have built-in regenerative resistors.
If the regenerative energy exceeds the specified value, connect an external regenerative resistor (optional).
2 SGDV-470A, -550A, -590A, -780A, -210D, -260D, -280D, -370D SERVOPACKs do not have built-in regenerative resistors.
Be sure to connect a regenerative resistor unit (optional) or an external regenerative resistor (optional). For selection details, refer to page 351.
3 Regenerative resistor power losses are allowable losses. Take the following action if this value is exceeded.
・Remove the lead or short bar that is short-circuiting the SERVOPACK main circuit terminal B2 and B3.
(SGDV-3R8A, -5R5A, -7R6A, -120A, -180A, -200A, -330A, or 400-V class SERVOPACKs.)
・Install an external regenerative resistor (optional). For selection details, refer to page 351.

Selecting Cables

●Cables for CN1 CN3 CN5 CN7 CN8 (Analog Voltage/Pulse Train Reference Type SERVOPACKs)



Name		Length	Order No.	Specifications	Details
CN1 Cables for I/O Signals	Connector Kit		JZSP-CSI9-1-E	Soldered 	(1)
	Connector Terminal Converter Unit	0.5 m	JUSP-TA50PG-E	Terminal Block and Connection Cable 	(2)
		1 m	JUSP-TA50PG-1-E		
		2 m	JUSP-TA50PG-2-E		
	Cables with Loose Wires at One End	1 m	JZSP-CSI01-1-E	Cable with Loose Wires at Peripheral Devices 	(3)
		2 m	JZSP-CSI01-2-E		
		3 m	JZSP-CSI01-3-E		
CN3	Digital Operator		JUSP-OP05A-1-E	With Connection Cable (1 m) 	(4)
	Digital Operator Converter Cable*1	0.3 m	JZSP-CVS05-A3-E	Cable with Connectors at Both Ends 	(5)
CN7 Connection Cables for Personal Computer		2.5 m	JZSP-CVS06-02-E	Cable with Connectors at Both Ends 	(6)
CN5 Cables for Analog Monitor		1 m	JZSP-CA01-E	SERVOPACK End 	(7)
CN8 Cable for Safety Function Device	Cables with Connector*2	3 m	JZSP-CVH03-03-E		(8)
	Connector Kit*3		Contact Tyco Electronics AMP K.K. Product name: Industrial Mini I/O D-shape Type1 Plug Connector Kit Model: 2013595-1		

*1 : A converter cable is required to use Σ-Ⅲ series digital operators (model: JUSP-OP05A) for Σ-Ⅴ series SERVOPACKs.
*2 : 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.
*3 : Use the connector kit when you make cables yourself.

Selecting Cables

(1) Connector Kit for CN1

Use the following connector and cable to assemble the cable.
The CN1 connector kit includes one case and one connector.

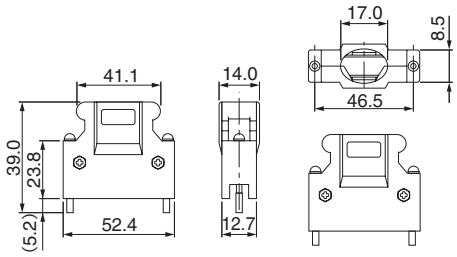
Connector Kit Model	Case		Connector	
	Model	Qty	Model	Qty
JZSP-CSI9-1-E	10350-52Z0-008*	1 set	10150-3000PE* (Soldered)	1

*: Manufactured by Sumitomo 3M Ltd.

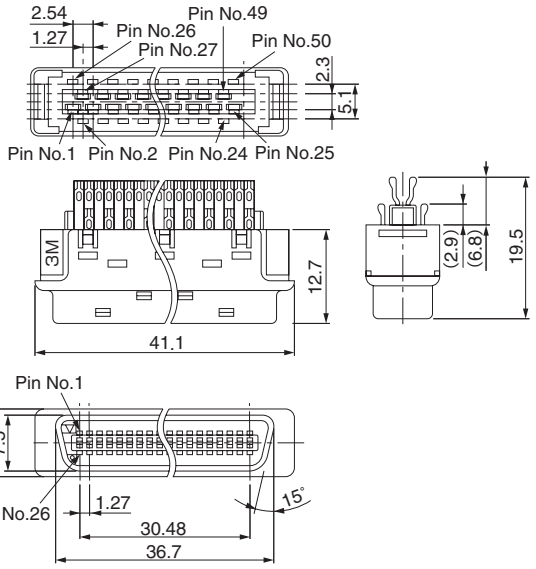
・Cable Size

Item	Specifications
Cable	Use twisted-pair or twisted-pair shielded wire.
Applicable Wires	AWG24, 26, 28, 30
Cable Finished Diameter	16 dia. max.

・External Dimensions of Case (Units: mm)

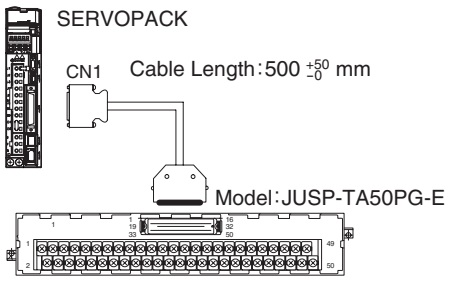


・External Dimensions of Connector (Units: mm)

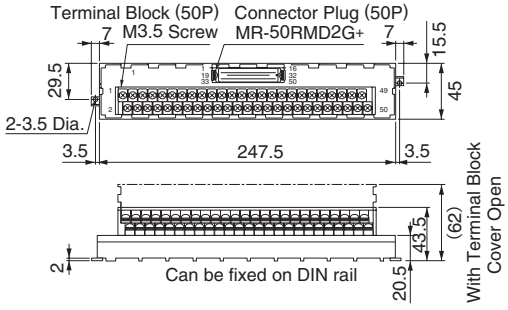


(2) Connector Terminal Converter Unit for CN1

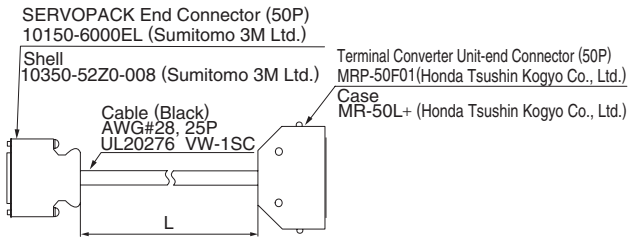
・Configurations



・External Dimensions of Terminal Block (Units: mm)



・External Dimensions of Cable (Units: mm)



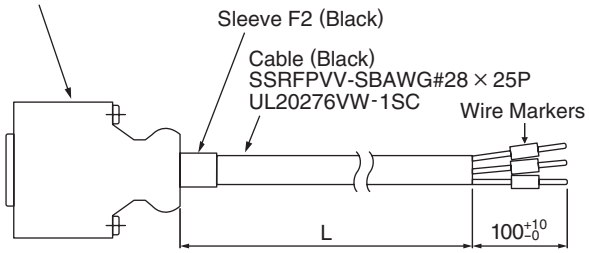
Model	Cable Length (L)
JUSP-TA50PG-E	0.5 m
JUSP-TA50PG-1-E	1 m
JUSP-TA50PG-2-E	2 m

Note: The pin numbers in the SERVOPACK connector and the pin numbers in the terminal block are the same. If assembling cables, refer to ●*Cable with Loose Wires at One End for CN1 Connection Diagram of JZSP-CSI01-□-E Cable* on the next page.

(3) Cable with Loose Wires at One End for CN1

・External Dimensions of Cable (Units: mm)

SERVOPACK End
Connector 10150-6000EL (50P)*
Case 10350-52Z0-008*



*: Manufactured by Sumitomo 3M Ltd.

Model	Cable Length (L)
JZSP-CSI01-1-E	1 m
JZSP-CSI01-2-E	2 m
JZSP-CSI01-3-E	3 m

●Cable with Loose Wires at One End for CN1

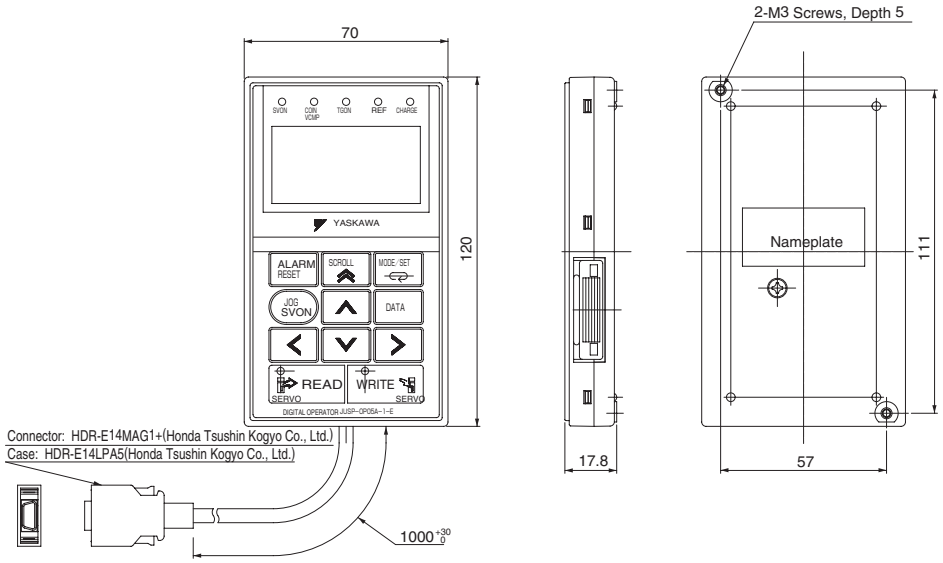
Connection Diagram of JZSP-CSI01-□-E Cable

SERVOPACK End					Host Controller End
Pin No.	Signal	Wire Color	Marking Color	Marking Dots	Lead Marker
1	SG	Orange	Red	1	1
3	PL1	Orange	Black	1	3
2	SG	Gray	Red	1	2
4	SEN	Gray	Black	1	4
5	V-REF	White	Red	1	5
6	SG	White	Black	1	6
7	PULS	Yellow	Red	1	7
8	/PULS	Yellow	Black	1	8
9	T-REF	Pink	Red	1	9
10	SG	Pink	Black	1	10
11	SIGN	Orange	Red	2	11
12	/SIGN	Orange	Black	2	12
13	PL2	Gray	Red	2	13
14	/CLR	White	Red	2	14
15	CLR	White	Black	2	15
16	–	Gray	Black	2	16
17	–	Yellow	Red	2	17
18	PL3	Yellow	Black	2	18
19	PCO	Pink	Red	2	19
20	/PCO	Pink	Black	2	20
21	BAT(+)	Orange	Red	3	21
22	BAT(–)	Orange	Black	3	22
23	–	Gray	Red	3	23
24	–	Gray	Black	3	24
25	/V-CMP+	White	Red	3	25
26	/V-CMP–	White	Black	3	26
27	/TGON+	Yellow	Red	3	27
28	/TGON–	Yellow	Black	3	28
29	/S-RDY+	Pink	Red	3	29
30	/S-RDY–	Pink	Black	3	30
31	ALM+	Orange	Red	4	31
32	ALM–	Orange	Black	4	32
33	PAO	Gray	Red	4	33
34	/PAO	Gray	Black	4	34
35	PBO	White	Red	4	35
36	/PBO	White	Black	4	36
37	ALO1	Yellow	Red	4	37
38	ALO2	Yellow	Black	4	38
39	ALO3	Pink	Red	4	39
40	/S-ON	Pink	Black	4	40
41	/P-CON	Orange	Red	5	41
42	P-OT	Orange	Black	5	42
43	N-OT	Gray	Red	5	43
44	/ALM-RST	Gray	Black	5	44
45	/P-CL	White	Red	5	45
46	/N-CL	White	Black	5	46
47	+24V-IN	Yellow	Red	5	47
48	–	Pink	Red	5	48
49	–	Pink	Black	5	49
50	–	Yellow	Black	5	50
Case	Shield				

: Represents twisted-pair wires.

Selecting Cables

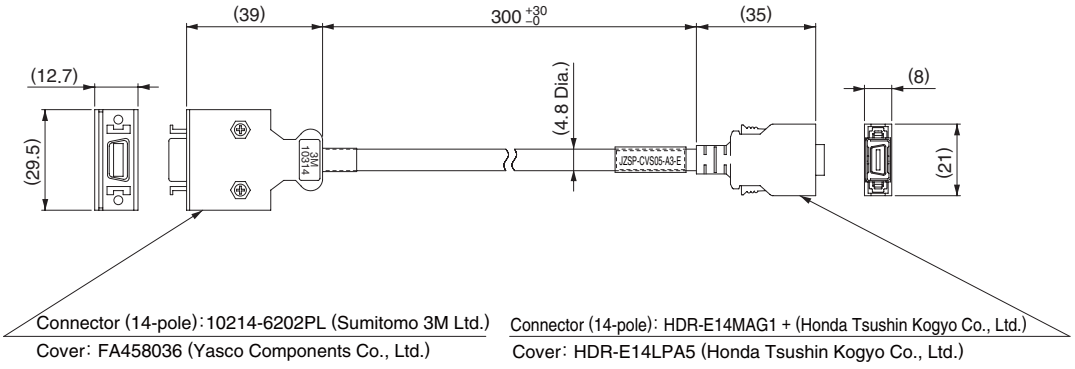
(4) Digital Operator (Model: JUSP-OP05A-1-E) (Units: mm)



(5) Digital Operator Converter Cable for CN3 (Model: JZSP-CVS05-A3-E)

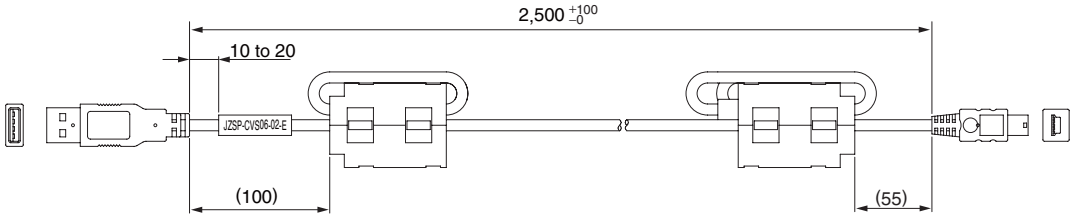
A converter cable is required to use Σ-Ⅲ series digital operators (model: JUSP-OP05A) for Σ-Ⅴ series SERVOPACKs.

- **External Dimensions** (Units: mm)



(6) Connection Cable for Personal Computer for CN7 (Model: JZSP-CVS06-02-E)

- **External Dimensions** (Units: mm)

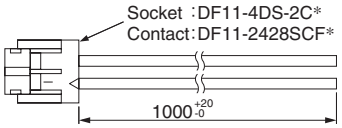


IMPORTANT

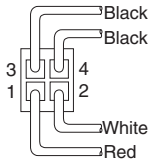
Use a cable specified by Yaskawa.
When using other cables, operation cannot be guaranteed.

(7) Cable for Analog Monitor for CN5 (Model: JZSP-CA01-E)

● **External Dimensions** (Units: mm)



* : Manufactured by Hirose Electric Corporation.



View from Cable End

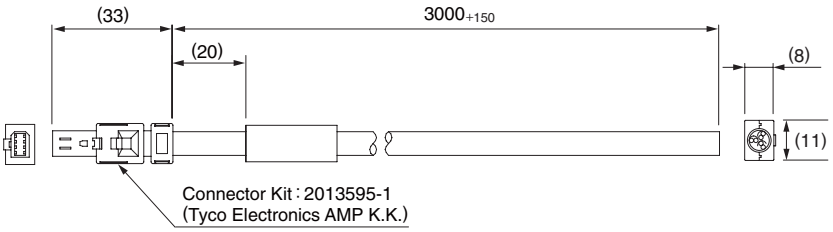
・Specifications

Pin No.	Cable Color	Signal	Standard Settings
1	Red	Analog Monitor 2	Motor speed : 1V/1000 min^{-1}
2	White	Analog Monitor 1	Torque reference : 1V/100% rated torque
3, 4	Black (2 cables)	GND(0V)	–

Note : The specifications above are factory settings. Monitor specifications can be changed by changing parameters Pn006 and Pn007.

(8) Cable with Connector for CN8 (Model: JZSP-CVH03-03-E)

● **External Dimensions** (Units: mm)



・Specifications

Pin No.	Signal	Lead Color	Marking Color
1	Not used	–	–
2	Not used	–	–
3	/HWBB1–	White	Black
4	/HWBB1+	White	Red
5	/HWBB2–	Gray	Black
6	/HWBB2+	Gray	Red
7	EDM1–	Orange	Black
8	EDM1+	Orange	Red