YASKAWA

AC SERVO DRIVES
Σ-Ⅲ SERIES
PRODUCT CATALOG

Certified for
ISO9001 and
ISO14001

JQA-0422

JQA-EM0202
JQA-EM0924

The Σ-Ⅲ Series – Raising the Bar for Fast and Accurate Positioning

Get the best servo performance and increased productivity with a tact time of a few milliseconds.

- Brings out the top potential in your machine, with high-speed, high-precision positioning.
- The wide motor selection includes ultra-compact models as well as flat models and a series of direct drive models.
- Reference input: Analog voltage/pulse train or MECHATROLINK-Ⅱ

Rotary Servo Drives

Analog Voltage or Pulse-train Reference/ Fully Closed Control

SERVOPACK
SGDS-□□□01/02

MECHATROLINK-Ⅱ Compatible
SERVOPACK
SGDS-□□□12

Direct-drive Servomotors

Rotary Servomotors

Note: The motors do not include the connectors shown in the photo.

Servomotors		Σ-Ⅲ Series SGDS SERVOPACK		
		Single-phase 100 VAC	Single-phase 200 VAC	Three-phase 200 VAC
SGMMJ (Σ-mini Series) 3000 min^{-1} 3 models	SGMMJ-A1B (10 W)	SGDS-A3B	–	–
	SGMMJ-A2B (20 W)	SGDS-A3B	–	–
	SGMMJ-A3B (30 W)	SGDS-A3B	–	–
SGMAS (Super High Power Capacity) 3000 min^{-1} 8 models	SGMAS-A5A (50 W)	SGDS-A5F	SGDS-A5A	–
	SGMAS-01A (100 W)	SGDS-01F	SGDS-01A	–
	SGMAS-C2A (150 W)	SGDS-02F	SGDS-02A	–
	SGMAS-02A (200 W)	SGDS-02F	SGDS-02A	–
	SGMAS-04A (400 W)	SGDS-04F	SGDS-04A	–
	SGMAS-06A (600 W)	–	SGDS-08A	–
	SGMAS-08A (750 W)	–	SGDS-08A	–
	SGMAS-12A (1.15 kW)	–	–	SGDS-15A
SGMPS (Flat Type) 3000 min^{-1} 5 models	SGMPS-01A (100 W)	SGDS-01F	SGDS-01A	–
	SGMPS-02A (200 W)	SGDS-02F	SGDS-02A	–
	SGMPS-04A (400 W)	SGDS-04F	SGDS-04A	–
	SGMPS-08A (750 W)	–	SGDS-08A	–
	SGMPS-15A (1.5 kW)	–	–	SGDS-15A
SGMSS (Super High Power Capacity) 3000 min^{-1} 8 models	SGMSS-10A (1.0 kW)	–	–	SGDS-10A
	SGMSS-15A (1.5 kW)	–	–	SGDS-15A
	SGMSS-20A (2.0 kW)	–	–	SGDS-20A
	SGMSS-25A (2.5 kW)	–	–	SGDS-30A
	SGMSS-30A (3.0 kW)	–	–	SGDS-30A
	SGMSS-40A (4.0 kW)	–	–	SGDS-50A
	SGMSS-50A (5.0 kW)	–	–	SGDS-50A
	SGMSS-70A (7.0 kW)	–	–	SGDS-75A
SGMGH (High-speed Feed Series) 1500 min^{-1} 8 models	SGMGH-05A (450 W)	–	–	SGDS-05A
	SGMGH-09A (850 W)	–	–	SGDS-10A
	SGMGH-13A (1.3 kW)	–	–	SGDS-15A
	SGMGH-20A (1.8 kW)	–	–	SGDS-20A
	SGMGH-30A (2.9 kW)	–	–	SGDS-50A(SGDS-30A)*
	SGMGH-44A (4.4 kW)	–	–	SGDS-50A
	SGMGH-55A (5.5 kW)	–	–	SGDS-60A
	SGMGH-75A (7.5 kW)	–	–	SGDS-75A
SGMGH (High-speed Feed Series) 1000 min^{-1} 8 models	SGMGH-03A (300 W)	–	–	SGDS-05A
	SGMGH-06A (600 W)	–	–	SGDS-10A
	SGMGH-09A (900 W)	–	–	SGDS-10A
	SGMGH-12A (1.2 kW)	–	–	SGDS-15A
	SGMGH-20A (2.0 kW)	–	–	SGDS-20A
	SGMGH-30A (3.0 kW)	–	–	SGDS-50A(SGDS-30A)*
	SGMGH-40A (4.0 kW)	–	–	SGDS-50A
	SGMGH-55A (5.5 kW)	–	–	SGDS-60A
SGMCS (Direct Drive) 200 min^{-1} 9 models 150 min^{-1} 8 models	SGMCS-02B	SGDS-02F	SGDS-02A	–
	SGMCS-05B	SGDS-02F	SGDS-02A	–
	SGMCS-07B	SGDS-02F	SGDS-02A	–
	SGMCS-04C	SGDS-04F	SGDS-04A	–
	SGMCS-08D	SGDS-04F	SGDS-04A	–
	SGMCS-10C	SGDS-04F	SGDS-04A	–
	SGMCS-14C	SGDS-04F	SGDS-04A	–
	SGMCS-17D	SGDS-04F	SGDS-04A	–
	SGMCS-25D	SGDS-04F	SGDS-04A	–
	SGMCS-16E	–	SGDS-08A	–
	SGMCS-35E	–	SGDS-08A	–
	SGMCS-45M	–	–	SGDS-10A
	SGMCS-80M	–	–	SGDS-15A
	SGMCS-1AM	–	–	SGDS-20A
	SGMCS-80N	–	–	SGDS-15A
	SGMCS-1EN	–	–	SGDS-30A
	SGMCS-2ZN	–	–	SGDS-30A

*: When using the SGMGH-30 servomotor and the SGDS-30A SERVOPACK together, the rated value of the servomotor will change. Use them considering the deratings shown in the right table.

Items		SGMGH-30A□A		SGMGH-30A□B	
		Deratings	Rated Value	Deratings	Rated Value
Rated Current	Arms	18.9	23.8	18.9	24.8
Rated Torque	N·m	14.8	18.6	21.6	28.4
Allowable Load Moment		3 times	5 times	5 times	
Rated Motor Speed	min^{-1}	1500		1000	

The Σ-Ⅲ Series – A Revolution in Linear Motion

Simple structure and ultra-high accuracy, using a direct-feed mechanism to improve machine performance.

- The direct-feed mechanism brings out the optimal performance in your machine.
- Linear sliders reduce lead time for system design and installation.
- Reference input: Analog voltage/pulse train or MECHATROLINK-Ⅱ

Linear Servo Drives

Linear Servomotors		Σ-Ⅲ Series SGDS SERVOPACK		
		Single-phase 100 VAC	Single-phase 200 VAC	Three-phase 200 VAC
SGLGW (Coreless, Standard Magnetic Way)	SGLGW-30A050C	SGDS-A5F	SGDS-A5A	–
	SGLGW-30A080C	SGDS-01F	SGDS-01A	–
	SGLGW-40A140C	SGDS-01F	SGDS-01A	–
	SGLGW-40A253C	SGDS-02F	SGDS-02A	–
	SGLGW-40A365C	SGDS-04F	SGDS-04A	–
	SGLGW-60A140C	SGDS-02F	SGDS-02A	–
	SGLGW-60A253C	SGDS-04F	SGDS-04A	–
	SGLGW-60A365C	–	SGDS-08A	–
	SGLGW-90A200C	–	–	SGDS-15A
	SGLGW-90A370C	–	–	SGDS-20A
	SGLGW-90A535C	–	–	SGDS-30A
SGLGW (Coreless, High-force Magnetic Way)	SGLGW-40A140C	SGDS-02F	SGDS-02A	–
	SGLGW-40A253C	SGDS-04F	SGDS-04A	–
	SGLGW-40A365C	–	–	SGDS-05A
	SGLGW-60A140C	SGDS-02F	SGDS-02A	–
	SGLGW-60A253C	–	–	SGDS-05A
	SGLGW-60A365C	–	–	SGDS-10A
SGLFW (With F-type Iron Core)	SGLFW-20A090A	SGDS-02F	SGDS-02A	–
	SGLFW-20A120A	SGDS-02F	SGDS-02A	–
	SGLFW-35A120A	SGDS-02F	SGDS-02A	–
	SGLFW-35A230A	–	–	SGDS-05A
	SGLFW-50A200B	–	SGDS-08A	–
	SGLFW-50A380B	–	–	SGDS-15A
	SGLFW-1ZA200B	–	–	SGDS-15A
	SGLFW-1ZA380B	–	–	SGDS-30A
SGLTW (With T-type Iron Core)	SGLTW-20A170A	–	–	SGDS-05A
	SGLTW-20A320A	–	–	SGDS-10A
	SGLTW-20A460A	–	–	SGDS-15A
	SGLTW-35A170A	–	SGDS-08A	–
	SGLTW-35A320A	–	–	SGDS-15A
	SGLTW-35A460A	–	–	SGDS-20A
	SGLTW-35A170H	–	SGDS-08A	–
	SGLTW-35A320H	–	–	SGDS-15A
	SGLTW-40A400B	–	–	SGDS-20A
	SGLTW-40A600B	–	–	SGDS-50A
	SGLTW-50A170H	–	SGDS-08A	–
	SGLTW-50A320H	–	–	SGDS-15A
	SGLTW-80A400B	–	–	SGDS-50A
	SGLTW-80A600B	–	–	SGDS-75A
SGLC (Cylinder type)	SGLC-D16A085A	SGDS-A5F	SGDS-A5A	–
	SGLC-D16A115A	SGDS-A5F	SGDS-A5A	–
	SGLC-D16A145A	SGDS-01F	SGDS-01A	–
	SGLC-D20A100A	SGDS-02F	SGDS-02A	–
	SGLC-D20A135A	SGDS-02F	SGDS-02A	–
	SGLC-D20A170A	SGDS-02F	SGDS-02A	–
	SGLC-D25A125A	SGDS-02F	SGDS-02A	–
	SGLC-D25A170A	SGDS-04F	SGDS-04A	–
	SGLC-D25A215A	–	SGDS-08A	–
	SGLC-D32A165A	SGDS-04F	SGDS-04A	–
	SGLC-D32A225A	–	SGDS-08A	–
	SGLC-D32A285A	–	SGDS-08A	–

Linear Sliders		Σ-Ⅲ Series SGDS SERVOPACK		
		Single-phase 100 VAC	Single-phase 200 VAC	Three-phase 200 VAC
Σ-Trac	SGT□GD□-□□□	SGDS-01F	SGDS-01A	–
	SGT□GE□-□□□	SGDS-02F	SGDS-02A	–
	SGT□GF□-□□□	SGDS-04F	SGDS-04A	–
	SGT□GG□-□□□	SGDS-02F	SGDS-02A	–
	SGT□GH□-□□□	SGDS-04F	SGDS-04A	–
	SGT□GI□-□□□	–	SGDS-08A	–
	SGT□F3□-□□□	SGDS-02F	SGDS-02A	–
	SGT□F4□-□□□	–	–	SGDS-05A
	SGT□F9□-□□□	–	SGDS-08A	–
	SGT□FA□-□□□	–	–	SGDS-15A
Σ-Trac-μ	SGTMM01-□□□	SGDS-A5F	SGDS-A5A	–
	SGTMM03-□□□	SGDS-01F	SGDS-01A	–
Σ-Trac-MAG	SGTMF4A-027	SGDS-02F	SGDS-02A	–
	SGTMF4B-036	SGDS-02F	SGDS-02A	–
	SGTMF5A-054	–	–	SGDS-08A
	SGTMF5B-072	–	–	SGDS-08A

North American Safety Standards (UL, CSA)

	Model	UL*1 Standards (UL File No.)	CSA*2 Standards	Certification
SERVOPACK	SGDS	UL508C (E147823)	CSA C22.2 No.14	UL
Servomotor	SGMMJ	UL1004 (E165827)	CSA C22.2 No.100	UL
	SGMAS			
	SGMPS			
	SGMSS			
	SGMGH			

*1: Underwriters Laboratories Inc.
*2: Canadian Standards Association.

CE Marking

	Model	Low Voltage Directive	EMC Directive		Certification
			EMI	EMS	
SERVOPACK	SGDS	EN50178	EN55011 class A group 1	EN61000-6-2	TÜV PS*
Servomotor	SGMMJ	IEC60034-1 IEC60034-5 IEC60034-8 IEC60034-9	EN55011 class A group 1	EN61000-6-2	TÜV PS*
	SGMAS				
	SGMPS				
	SGMSS				
	SGMGH				

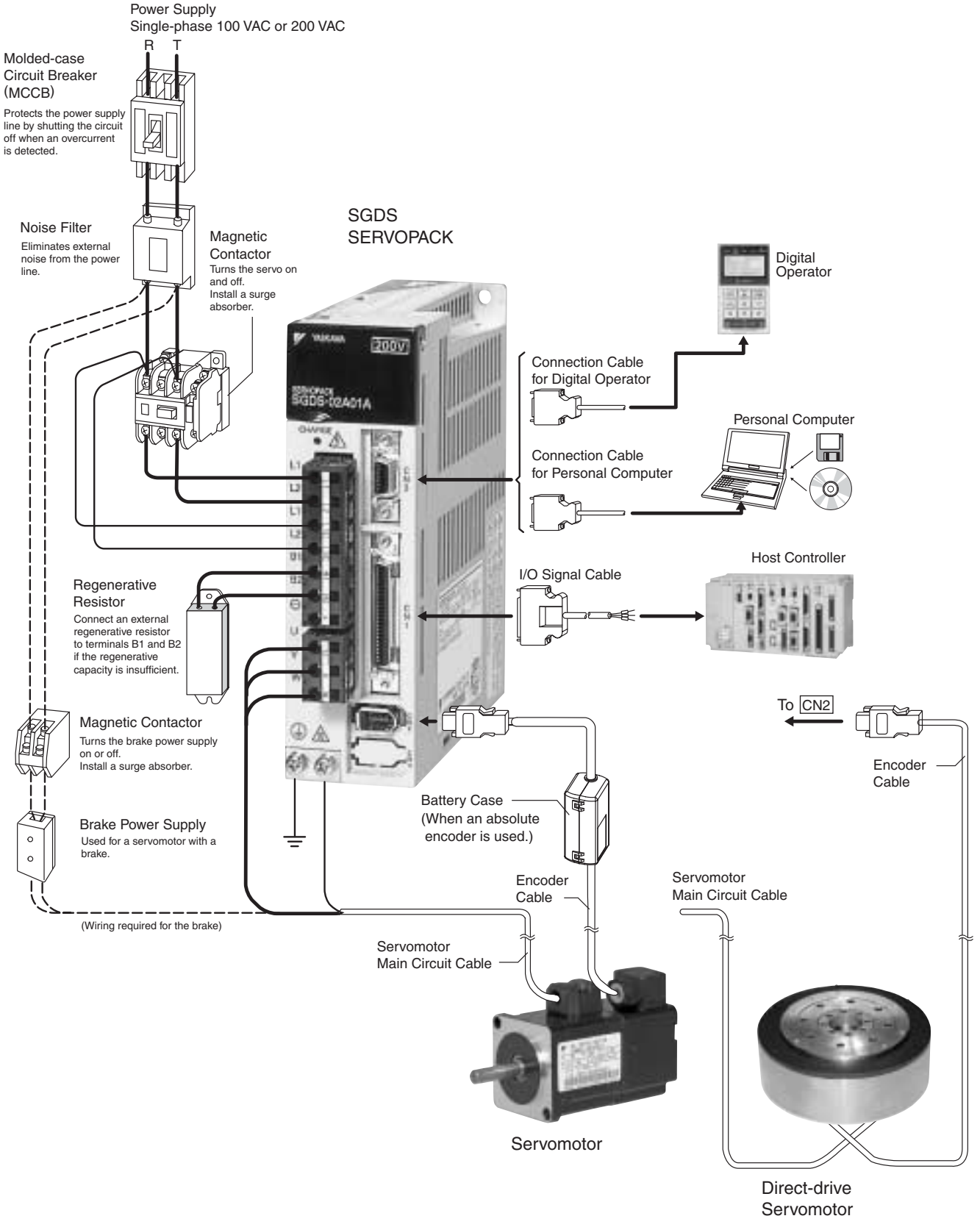
*: TÜV Product Services GmbH
Note: Refer to the User's Manual for details on installation conditions. Because SERVOPACKs and servomotors are built-in type, reconfirmation is required after being installed in the final product.

Contents

Σ-Ⅲ AC SERVODRIVE

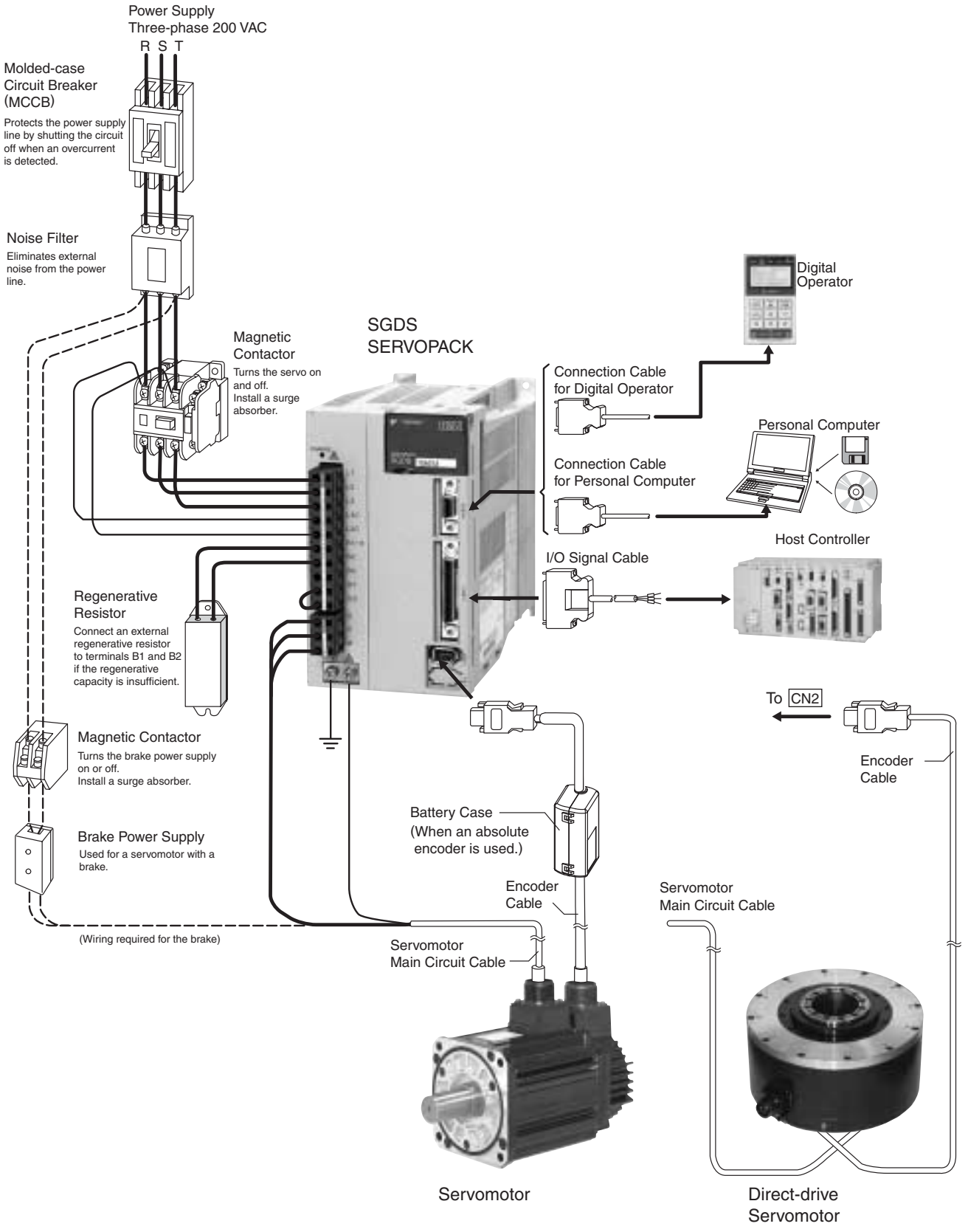
- For Analog Voltage Reference or Pulse-train Reference
  Single-phase 100 VAC or 200 VAC

Note: Refer to page 218 for system configuration example for fully-closed control.



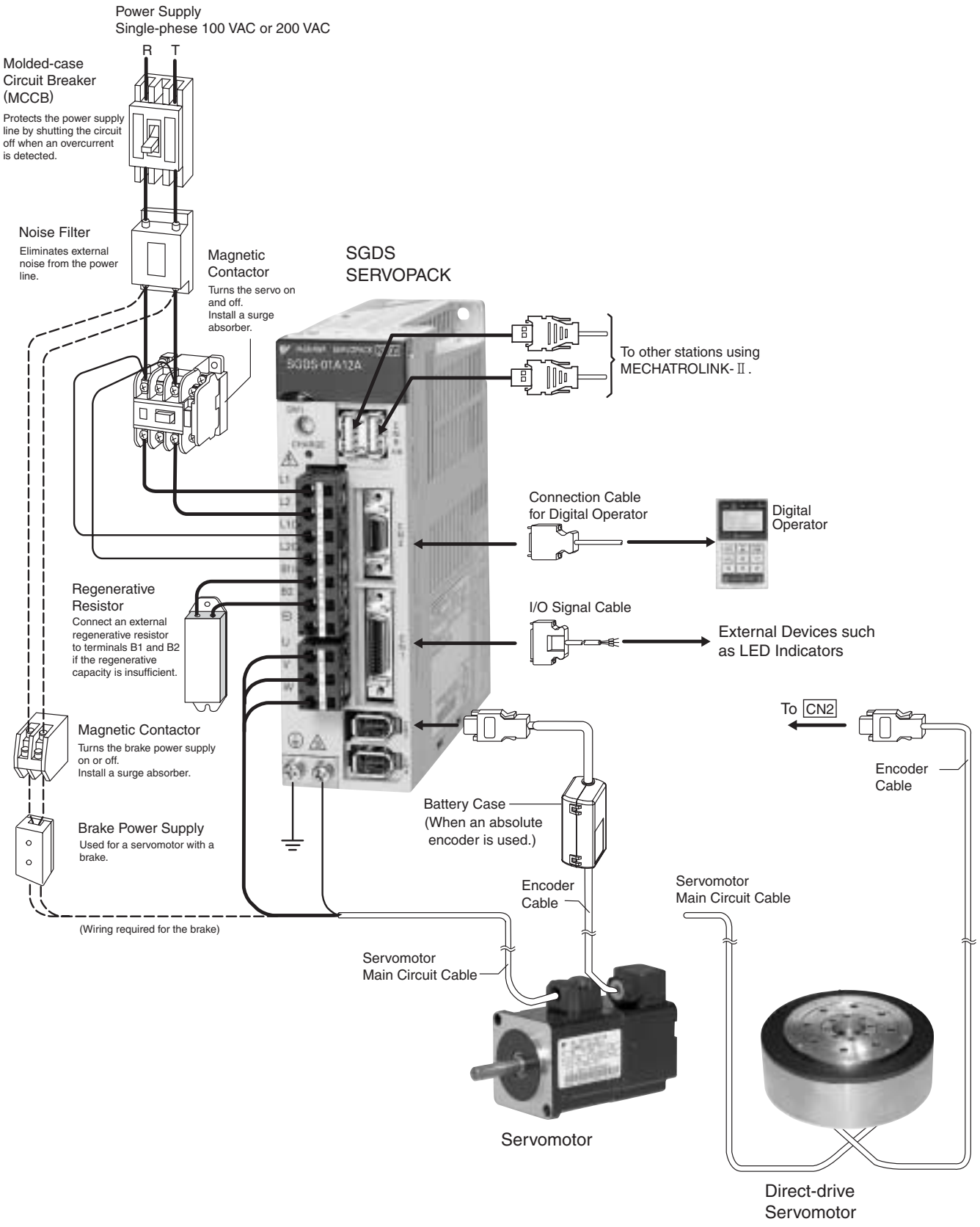
- For Analog Voltage Reference or Pulse-train Reference
  Three-phase 200 VAC

Note: Refer to page 218 for an example of system configuration for fully-closed control.



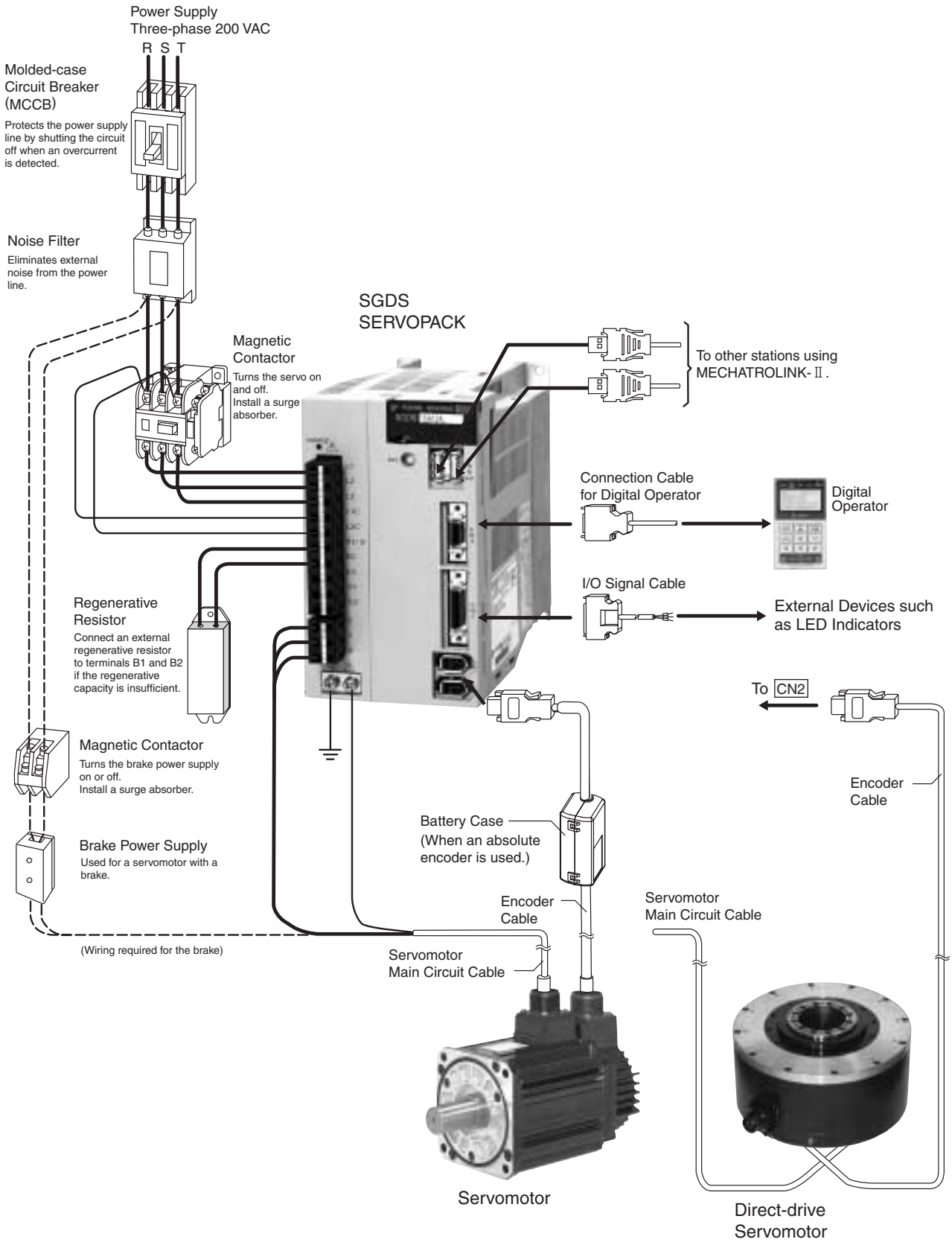
- For MECHATROLINK-Ⅱ Communications
  Single-phase 100 VAC or 200 VAC

Note: Refer to page 252 for an example of system configuration for fully-closed control.

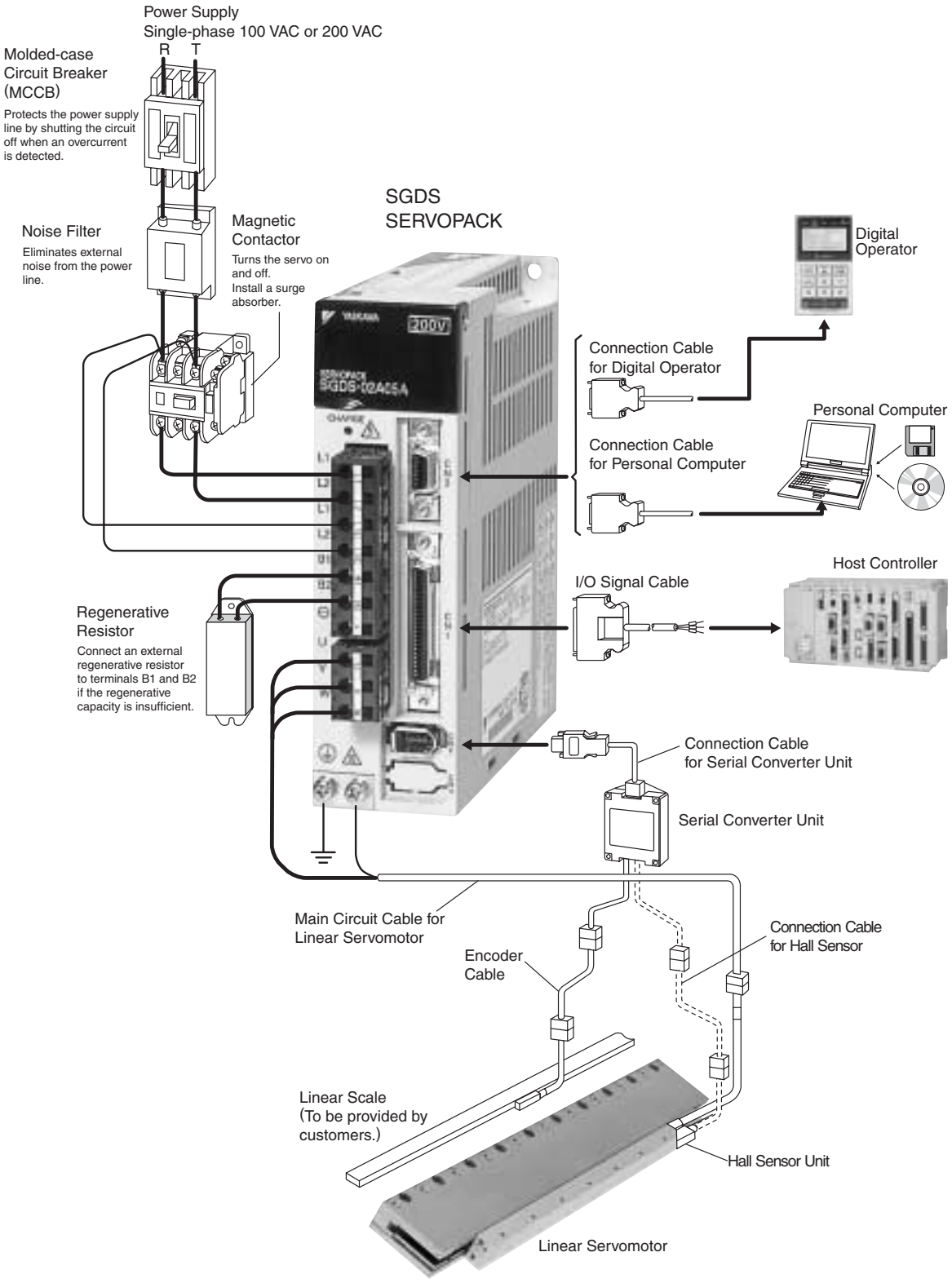


- For MECHATROLINK-Ⅱ Communications
  Three-phase 200 VAC

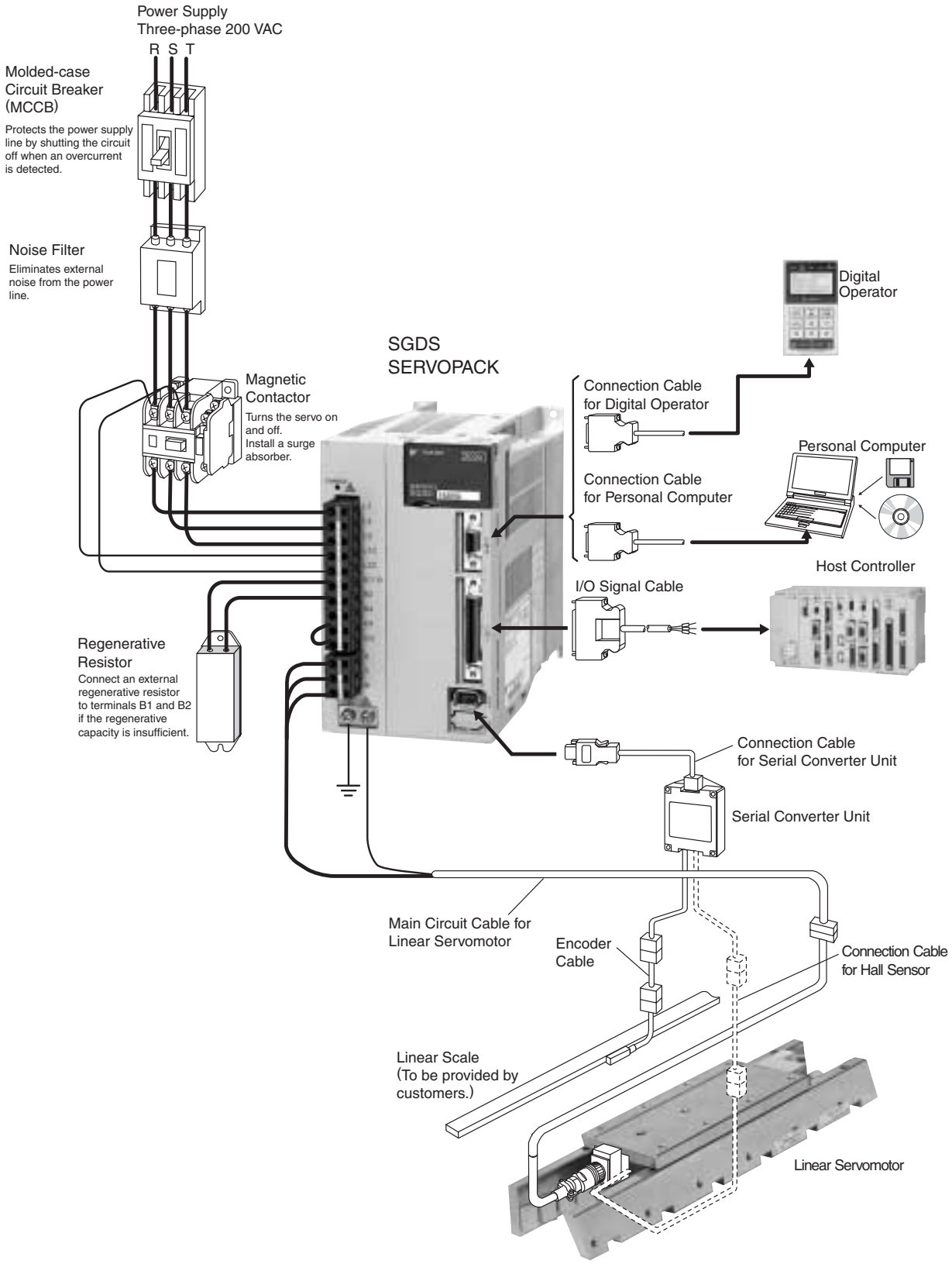
Note: Refer to page 252 for an example of system configuration for fully-closed control.



- For Analog Voltage Reference or Pulse-train Reference
  Single-phase 100 VAC or 200 VAC

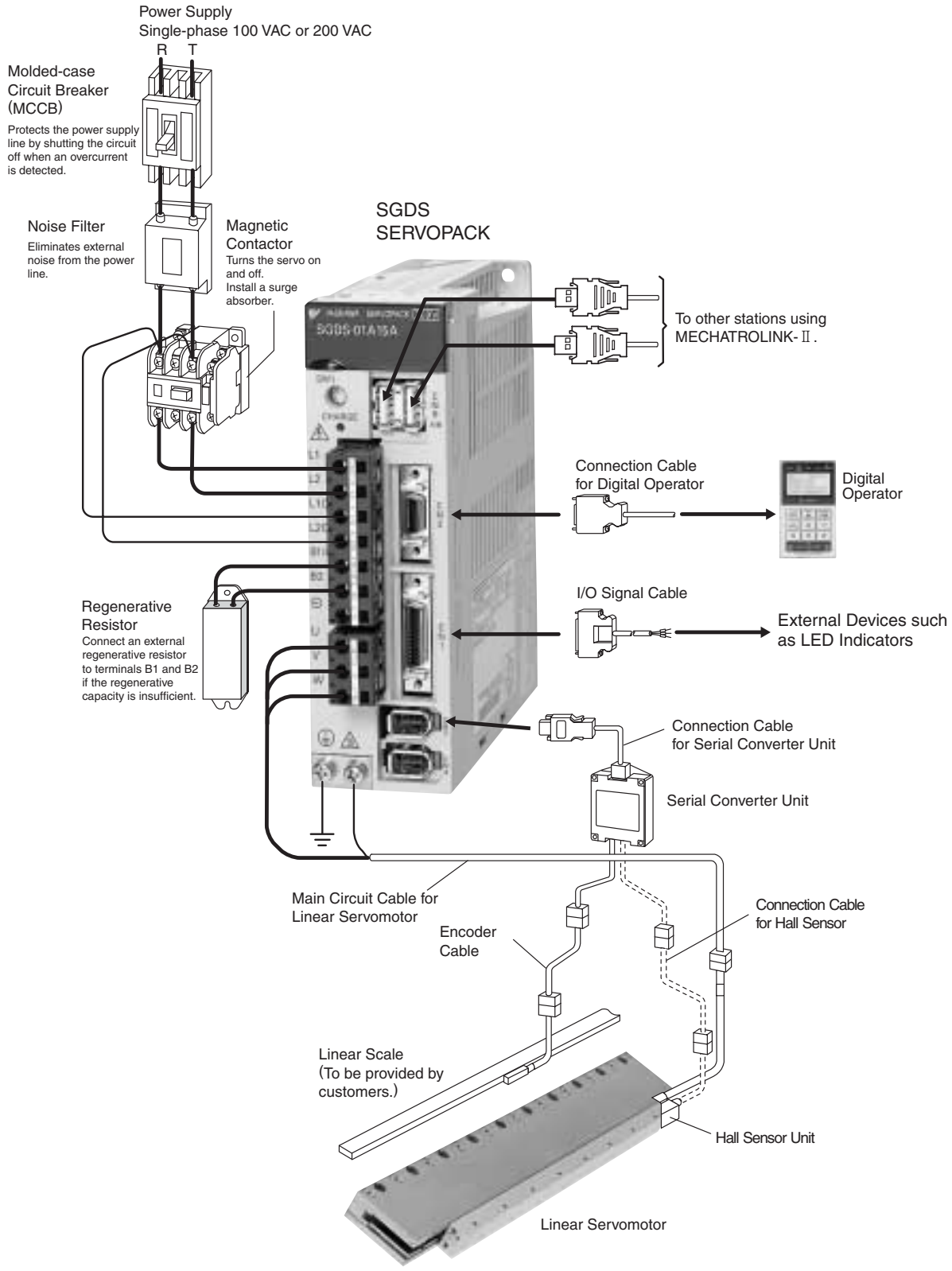


- For Analog Voltage Reference or Pulse-train Reference
  Three-phase 200 VAC

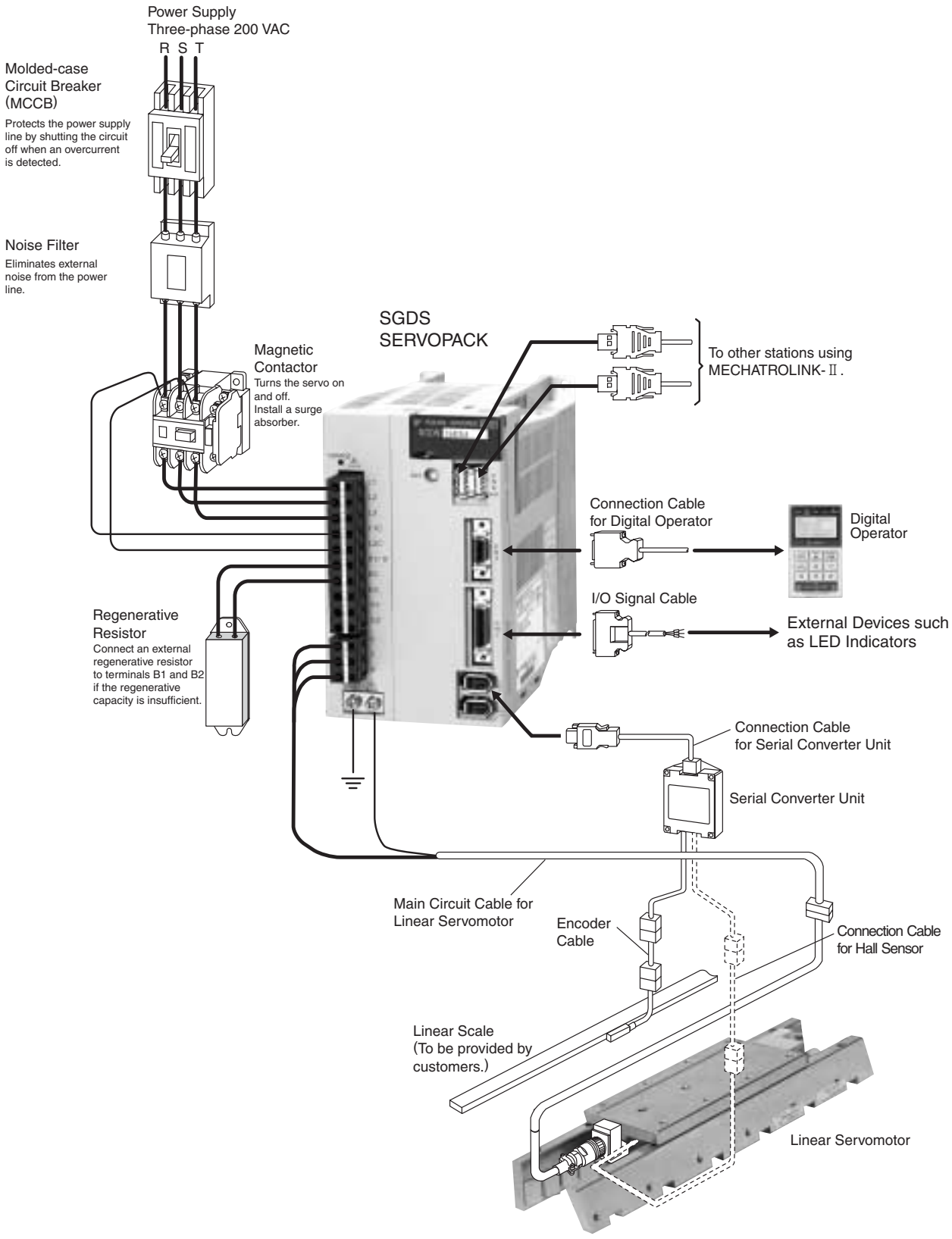


System Configuration Example | Linear Servo Drives

- For MECHATROLINK-Ⅱ Communications
  Single-phase 100 VAC or 200 VAC

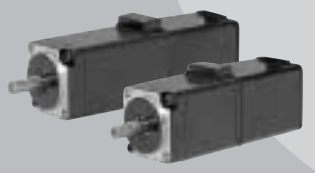


- For MECHATROLINK-Ⅱ Communications
  Three-phase 200 VAC



Servomotors

SGMMJ



Model Designation

●Without Gears

SGMMJ - A1 B A B 2 1 □

1st+2nd digits	3rd digit	4th digit	5th digit	6th digit	7th digit	8th digit

Σ-mini series SGMMJ servomotor

1st + 2nd digits Rated Output

Code	Specifications
A1	10 W
A2	20 W
A3	30 W

3rd digit Power Supply Voltage

Code	Specifications
B	100 VAC

4th digit Encoder

Code	Specifications
A	13-bit incremental encoder (standard) *1
2	17-bit absolute encoder (standard) *2

*1: The number of encoder pulses is 2048 P/Rev.
*2: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
B	Standard (Applicable for SGDS SERVOPACK)

6th digit Shaft End

Code	Specifications
2	Straight without flat (standard)
A	Straight with flat (optional)

7th digit Brakes

Code	Specifications
1	Without brakes
C	With 24-VDC brakes

8th digit Options

Code	Specifications
Blank	Lead length: 300 mm
H	Lead length: 500 mm
J	Lead length: 1000 mm
K	Lead length: 1500 mm

Features

- Ultra-compact: □25 mm
- Wide selection: 10 W to 30 W capacity, brake and gear options
- Mounted encoder: 13 or 17 bits
- Maximum speed: 5,000 min^{-1}

Application Examples

- Chip mounters
- PCB drilling stations
- Robots

●With Gears

SGMMJ - A1 B A B J 1 2 1 □

Σ-mini series SGMMJ servomotor	1st+2nd digits	3rd digit	4th digit	5th digit	6th digit	7th digit	8th digit	9th digit	10th digit

1st + 2nd digits Rated Output

Code	Specifications
A1	10 W
A2	20 W
A3	30 W

3rd digit Power Supply Voltage

Code	Specifications
B	100 VAC

4th digit Encoder

Code	Specifications
A	13-bit incremental encoder (standard) ∗1
2	17-bit absolute encoder (standard) ∗2

∗1: The number of encoder pulses: 2048 P/Rev.
∗2: The number of encoder pulses: 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
B	Standard (Applicable for SGDS SERVOPACK)

6th digit Gears

Code	Specifications
J	With gears

7th digit Gear Ratio

Code	Gear Ratio	Remarks
1	1/5	For SGMMJ-A3
2	1/16	(Gear mounting flange:
3	1/25	□40 mm)
A	1/5	For SGMMJ-A1 and -A2
B	1/16	(Gear mounting flange:
C	1/25	□25 mm)

8th digit Shaft End

Code	Specifications
2	Straight without flat (standard)
6	Straight with key and tap (optional)

9th digit Brakes

Code	Specifications
1	Without brakes
C	With 24-VDC brakes

10th digit Options

Code	Specifications
Blank	Lead length: 300 mm
H	Lead length: 500 mm
J	Lead length: 1000 mm
K	Lead length: 1500 mm

Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Thermal Class: B
Withstand Voltage: 1000 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

Voltage			100 V		
Servomotor Model SGMMJ-□□□			A1B	A2B	A3B
Rated Output*1		W	10	20	30
Rated Torque*1, *2		N·m	0.0318	0.0638	0.0955
Instantaneous Peak Torque*1		N·m	0.0955	0.191	0.287
Rated Current*1		Arms	0.70	0.66	0.98
Instantaneous Max. Current*1		Arms	2.0	1.9	2.9
Rated Speed*1		min^{-1}	3000		
Max. Speed*1		min^{-1}	5000		
Torque Constant		N·m /Arms	0.0516	0.107	0.107
Rotor Moment of Inertia J	Incremental	$kg·m^2 \times 10^{-4}$	0.00354 (0.00479)	0.00548 (0.00673)	0.00750 (0.00875)
	Absolute		0.00272 (0.00397)	0.00466 (0.00591)	0.00668 (0.00793)
Rated Power Rate*1		kW/s	2.87	7.41	12.2
Rated Angular Acceleration*1		rad/s^2	90000	116000	127000

*1: These items and torque-motor speed characteristics quoted in combination with SGDS SERVOPACKs are at an armature winding temperature of 100℃. Other values quoted at 20℃. All values are typical.
*2: Rated torques are continuous allowable torque values at 40℃ with an aluminum plate (heat sink) attached.
A1B and A2B: 150 × 150 × 3 (mm)
A3B: 250 × 250 × 6 (mm),
Note: The values in parentheses are for servomotors with holding brakes.

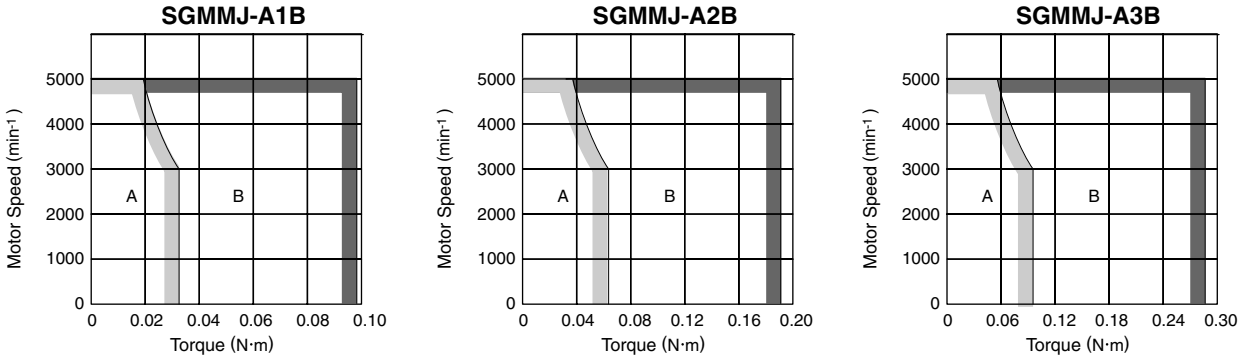
● Holding Brake Electrical Specifications

Holding Brake Rated Voltage	Servomotor Model	Servomotor Capacity W	Holding Brake Specifications			
			Capacity W	Holding Torque N·m	Coil Resistance Ω (at 20℃)	Rated Current A (at 20℃)
24 VDC	SGMMJ-A1B	10	2.0	0.0318	320	0.08
	SGMMJ-A2B	20	2.6	0.0638	222	0.11
	SGMMJ-A3B	30	2.6	0.0955	220	0.11

Note: The holding brake is only used to hold the load and cannot be used to stop the servomotor.

● Torque-motor Speed Characteristics

A Continuous Duty Zone B Intermittent Duty Zone



Ratings and Specifications

● Allowable Load Moment of Inertia at the Motor Shaft

The rotor moment of inertia ratio is the value for a servomotor without a gear and a brake.

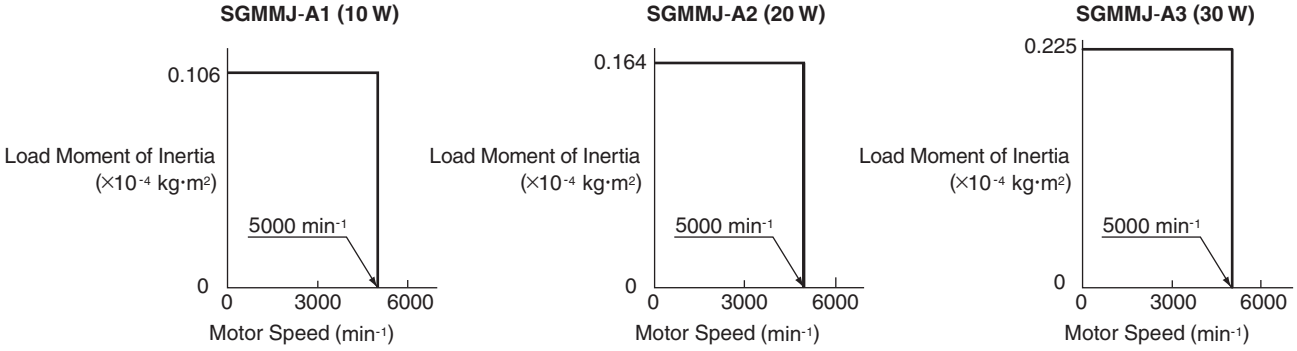
Servomotor Model	Capacity Range	Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)
SGMMJ (100 V)	10 W to 30 W	× 30

● Load Moment of Inertia

The larger the load moment of inertia, the worse the movement response of the load.
The size of the load moment of inertia (J_L) allowable when using a servomotor depends on motor capacity and is limited to within 5 to 30 times the moment of inertia of each servomotor (J_M). This value is provided strictly as a guideline and results may vary depending on servomotor drive conditions.
An overvoltage alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a regeneration overload alarm (A.320). Take one of the following steps if this occurs.

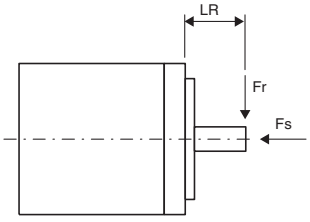
- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared. Contact your Yaskawa Application Engineering Department.

● Load Moment of Inertia and Motor Speed



● Allowable Radial and Thrust Loads

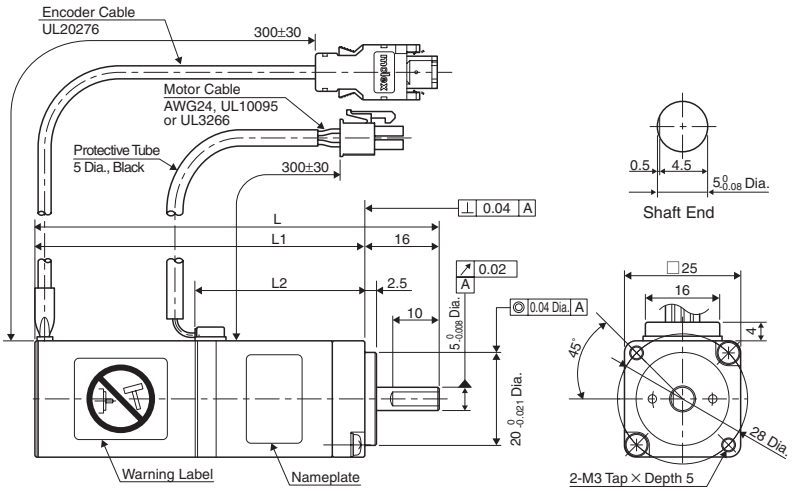
Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model		Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
SGMMJ-	A1B□B2	34.3	14.7	16	
	A1B□BA				
	A2B□B2	44.1			
	A2B□BA				
	A3B□B2				
	A3B□BA				

External Dimensions Units: mm

● Without Brakes

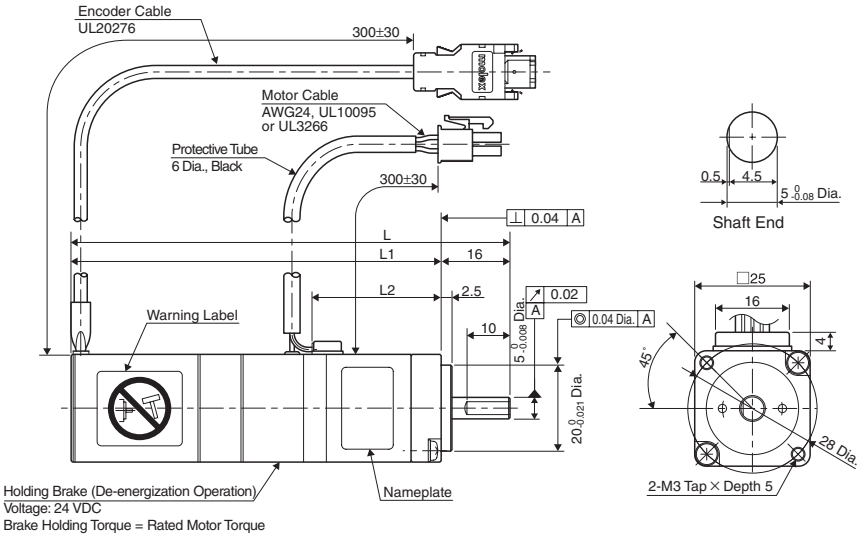
● 10 W to 30 W



Model SGMMJ-	L	L1	L2	Flat	Approx. Mass g
A1B□B21□	77	61	26.5	Not applied	130
A1B□BA1□				Applied	
A2B□B21□	87	71	36.5	Not applied	170
A2B□BA1□				Applied	
A3B□B21□	97	81	46.5	Not applied	210
A3B□BA1□				Applied	

● With Brakes

● 10 W to 30 W

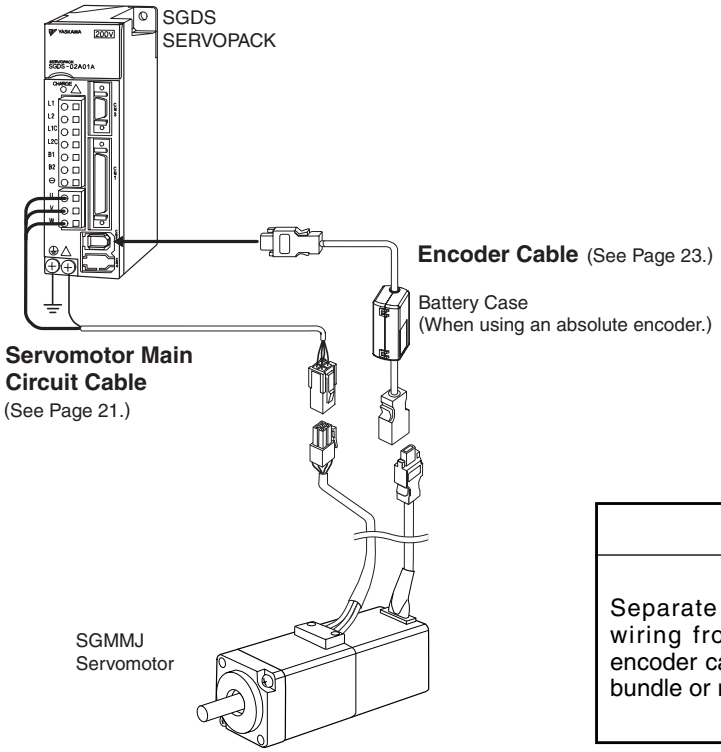


Model SGMMJ-	L	L1	L2	Flat	Approx. Mass g
A1B□B2C□	101.5	85.5	26.5	Not applied	215
A1B□BAC□				Applied	
A2B□B2C□	115.5	99.5	36.5	Not applied	270
A2B□BAC□				Applied	
A3B□B2C□	125.5	109.5	46.5	Not applied	310
A3B□BAC□				Applied	

Note: The electromagnetic brake is only used to hold the position and cannot be used to stop the servomotor.

Selecting Cables

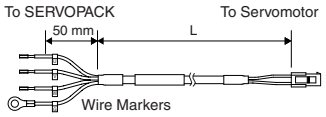
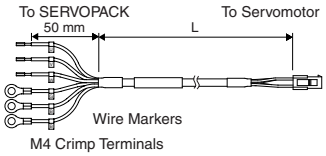
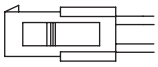
● Cable Connection



⚠ CAUTION

Separate the servomotor main circuit wiring from the I/O signal cable and encoder cable at least 30 cm, and do not bundle or run them in the same duct.

● Servomtor Main Circuit Cables

Name	Length	Order No.		Specifications	Details
		Standard Cable	Flexible Cable		
For Servomotors without Brakes	3 m	JZSP-CDM03-03-E	JZSP-CDM23-03-E		(1)
	5 m	JZSP-CDM03-05-E	JZSP-CDM23-05-E		
	10 m	JZSP-CDM03-10-E	JZSP-CDM23-10-E		
	15 m	JZSP-CDM03-15-E	JZSP-CDM23-15-E		
	20 m	JZSP-CDM03-20-E	JZSP-CDM23-20-E		
For Servomotors with Brakes	3 m	JZSP-CDM33-03-E	JZSP-CDM43-03-E		(2)
	5 m	JZSP-CDM33-05-E	JZSP-CDM43-05-E		
	10 m	JZSP-CDM33-10-E	JZSP-CDM43-10-E		
	15 m	JZSP-CDM33-15-E	JZSP-CDM43-15-E		
	20 m	JZSP-CDM33-20-E	JZSP-CDM43-20-E		
Connector Kit to Servomotors without Brakes		JZSP-CFM9-2-E			(3)
Connector Kit to Servomotors with Brakes		JZSP-CFM9-3-E			
Cables	5 m	JZSP-CSM90-05-E	JZSP-CSM80-05-E	20 m Max. 	(4)
	10 m	JZSP-CSM90-10-E	JZSP-CSM80-10-E		
	15 m	JZSP-CSM90-15-E	JZSP-CSM80-15-E		
	20 m	JZSP-CSM90-20-E	JZSP-CSM80-20-E		

Selecting Cables

(1) Wiring for Servomotors without Brakes

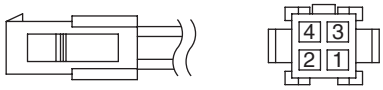
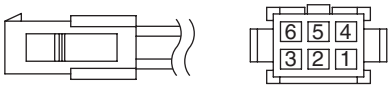
Leads to SERVOPACK		Connector to Servomotor	
Wire Color	Signal	Signal	Pin No.
Red	Phase U	Phase U	1
White	Phase V	Phase V	2
Blue	Phase W	Phase W	3
Green/yellow	FG	FG	4

(2) Wiring for Servomotor with Brakes

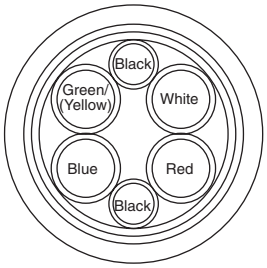
Leads to SERVOPACK		Connector to Servomotor	
Wire Color	Signal	Signal	Pin No.
Red	Phase U	Phase U	1
White	Phase V	Phase V	2
Blue	Phase W	Phase W	3
Green/yellow	FG	FG	4
Black	Brake	Brake	5
Balck	Brake	Brake	6

Note: No polarity for connection to a brake

(3) Connector Kits to Servomotor

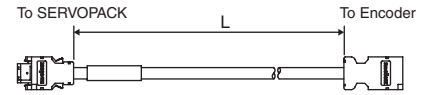
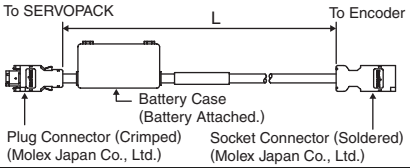
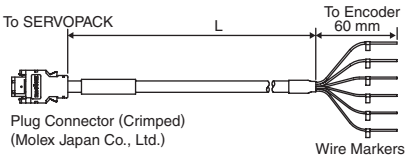
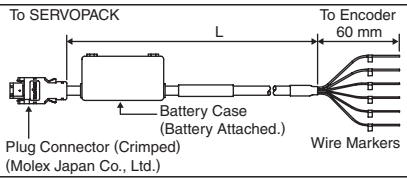
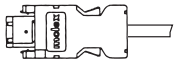
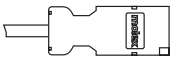
Items		Applicable Servomotors: SGMMJ-A1 to A3	
		Without Brakes (For Standard Cables)	With Brakes (For Standard Cables)
Order No.		JZSP-CFM9-2-E	JZSP-CFM9-3-E
Manufacturer		Molex Japan Co., Ltd	
Plug		5559-04P-210	5559-06P-210
Pin		5558TL	
Applicable Wire Size		AWG18 to 24	
Caulking Tool	Assembly Required	Model: 5558□L Applicable crimp tool: 57026-5000 (For UL1007) 57027-5000 (For UL1015)	
	Assembly not Required	Body: M15A or 57117-4000 Module crimp die: 57022-3000	
Dimensional Drawings			

(4) Cables

Items	Standard Cable	Flexible Cable
Order No.	JZSP-CSM90-□□-E (20 m max.)	JZSP-CSM80-□□-E (20 m max.)
Specifications	UL2517 (Max. operating temperature: 105°C) AWG20 × 6C For power line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.53 mm For brake line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.53 mm	UL2517 (Max. operating temperature: 105°C) AWG22 × 6C For power line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm For brake line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm
Finished Dimensions	7 ±0.3 dia. mm	
Internal Configuration and Lead Color		
Yaskawa Standard Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

Selecting Cables

● Encoder Cables and Connectors

Name	Length	Order No. Standard Cable	Order No. Flexible Cable	Specifications	Details
Cables with Connectors at Both Ends (For Incremental Encoder)	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E		(1)
	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E		
	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E		
	15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E		
	20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E		
Cables with Connectors at Both Ends (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E		(2)
	5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E		
	10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E		
	15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E		
	20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E		
Cables with Loose Wires to Encoder (For Incremental Encoder)	3 m	JZSP-CMP03-03-E	JZSP-CMP13-03-E		(3)
	5 m	JZSP-CMP03-05-E	JZSP-CMP13-05-E		
	10 m	JZSP-CMP03-10-E	JZSP-CMP13-10-E		
	15 m	JZSP-CMP03-15-E	JZSP-CMP13-15-E		
	20 m	JZSP-CMP03-20-E	JZSP-CMP13-20-E		
Cables with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP04-03-E	JZSP-CSP24-03-E		(4)
	5 m	JZSP-CSP04-05-E	JZSP-CSP24-05-E		
	10 m	JZSP-CSP04-10-E	JZSP-CSP24-10-E		
	15 m	JZSP-CSP04-15-E	JZSP-CSP24-15-E		
	20 m	JZSP-CSP04-20-E	JZSP-CSP24-20-E		
Connector Kit to SERVOPACK		JZSP-CMP9-1-E		Soldered 	(5)
Connector Kit to Encoder		JZSP-CMP9-2-E		Soldered 	(5)
Cables	5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	20 m Max. 	(6)
	10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E		
	15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E		
	20 m	JZSP-CMP09-20-E	JZSP-CSP39-20-E		
	30 m	JZSP-CMP19-30-E	—	50 m Max. 	
	40 m	JZSP-CMP19-40-E	—		
	50 m	JZSP-CMP19-50-E	—		

(1) Wiring for Cable with Connectors (For Incremental Encoder)

To SERVOPACK

Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

Shield Wire

To Encoder (Servomotor)

Pin No.	Lead Color Standard	Lead Color Flexible
6	Light blue/white	Black/light blue
5	Light blue	Red/light blue
4	Orange/white	Black/pink
3	Orange	Red/pink
2	Black	Green
1	Red	Orange
Shell	FG	FG

(2) Wiring for Cable with Connectors (For Absolute Encoder, with a Battery Case)

To SERVOPACK

Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

Shield Wire

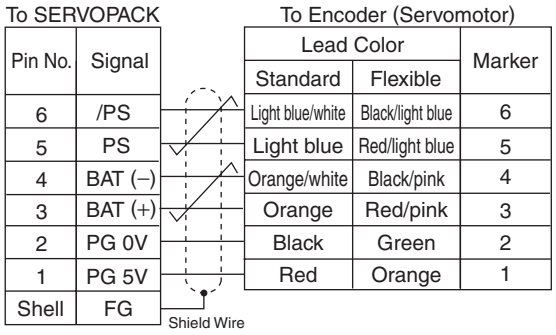
Battery Case

Pin No.	Signal
2	BAT(–)
1	BAT(+)

To Encoder (Servomotor)

Pin No.	Lead Color Standard	Lead Color Flexible
6	Light blue/white	Black/pink
5	Light blue	Red/pink
4	Orange/white	Black/light blue
3	Orange	Red/light blue
2	Black	Green
1	Red	Orange
Shell	FG	FG

(3) Wiring for Cable with Loose Wires to Encoder (For Incremental Encoder)

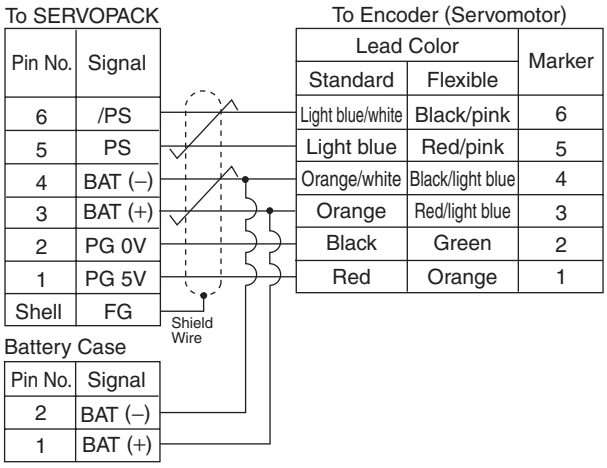


Pin No.	Signal	Lead Color		Marker
		Standard	Flexible	
6	/PS	Light blue/white	Black/light blue	6
5	PS	Light blue	Red/light blue	5
4	BAT (–)	Orange/white	Black/pink	4
3	BAT (+)	Orange	Red/pink	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

Notes: 1 The signals BAT (+) and BAT (–) are used when using an absolute encoder.

2 Be sure to connect the shield wire of encoder cable to the connector case (shell).

(4) Wiring for Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)

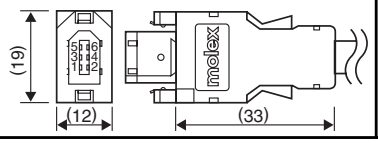
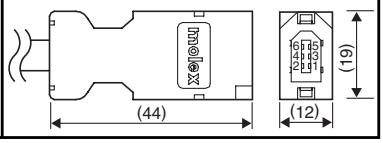


Pin No.	Signal	Lead Color		Marker
		Standard	Flexible	
6	/PS	Light blue/white	Black/pink	6
5	PS	Light blue	Red/pink	5
4	BAT (–)	Orange/white	Black/light blue	4
3	BAT (+)	Orange	Red/light blue	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

Pin No.	Signal
2	BAT (–)
1	BAT (+)

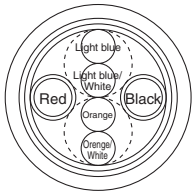
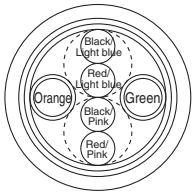
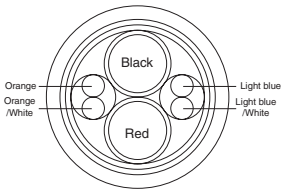
Note: Be sure to connect the shield wire of encoder cable to the connector case (shell).

(5) Connector Kits to SERVOPACK

Items	To SERVOPACK	To Servomotor (Encoder)
Order No.	JZSP-CMP9-1-E	JZSP-CMP9-2-E
Manufacturer	Molex Japan Co., Ltd.	Molex Japan Co., Ltd.
Connector Model No.	55100-0670 (soldered)	54280-0609 (soldered)
Dimensional Drawings (Units: mm)		

Note: The mating connector model No. on SERVOPACK: 53460-0611
The mating connector model No. on servomotor: 55102-0600

(6) Cables

Items	Standard Cable	Flexible Cable	Standard Cable
Order No.*	JZSP-CMP09-□□-E	JZSP-CSP39-□□-E	JZSP-CMP19-□□-E
Cable Length	20 m max.		50 m max.
Specifications	UL20276 (Max. operating temperature: 80°C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.15 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.09 mm	UL20276 (Max. operating temperature: 80°C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.35 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.21 mm	UL20276 (Max. operating temperature: 80°C) AWG16×2C+AWG26×2P AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.0 mm AWG26 (0.13 mm²) Outer diameter of insulating sheath: 0.91 mm
Finished Dimensions	6.5 dia. mm	6.8 dia. mm	6.8 dia. mm
Internal Configuration and Lead Color			
Yaskawa Standards Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m		Cable length: 30 m, 40 m, 50 m

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP09-05-E (5 m)

With Standard Backlash Gears | Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Gear Mechanism: Planetary gear mechanism
Thermal Class: B

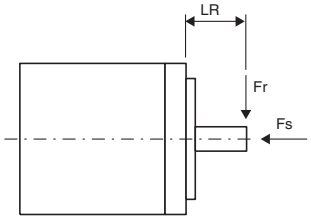
Withstand Voltage: 1000 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 15 to 20 arc-min max.
Gear Rotation Direction: Same direction as servomotor

Servomotor Model SGMMJ-	Servomotor			Gear Output					Moment of Inertia kg·m²×10⁻⁴	
	Output W	Rated Speed min⁻¹	Rated Torque N·m	Gear Ratio	Rated Torque/ Efficiency*1 N·m	Instantaneous Peak Torque N·m	Rated Speed min⁻¹	Max. Speed*2 min⁻¹	Motor+ Gears	Gears
A1B□BJA□□□	10	3000	0.0318	1/5	0.127/80	0.43	600	1000	0.00529	0.00175
A1B□BJB□□□				1/16	0.407/80	1.38	188	313	0.00454	0.00100
A1B□BJC□□□				1/25	0.636/80	2.15	120	200	0.00418	0.00064
A2B□BJA□□□	20	3000	0.0638	1/5	0.255/80	0.86	600	1000	0.00723	0.00175
A2B□BJB□□□				1/16	0.815/80	2.55*4	188	313	0.00648	0.00100
A2B□BJC□□□				1/25	1.27/80	2.26*4	120	200	0.00612	0.00064
A3B□BJ1□□□	30	3000	0.0955	1/5	0.382/80	1.29	600	1000	0.00917	0.00167
A3B□BJ2□□□				1/16	1.22/80	3.23*4	188	313	0.00842	0.00092
A3B□BJ3□□□				1/25	1.91/80	4.31*4	120	200	0.00806	0.00056

*1: Gear output torque is expressed using the following equation.
(Gear output torque) = (servomotor output torque) × (gear) × (efficiency)
*2: Maximum motor speed is up to 5000 min⁻¹ at the shaft.
*3: This brake is for holding (de-energization operation) and cannot be used to stop the servomotor.
*4: The allowable torque is limited by gear.

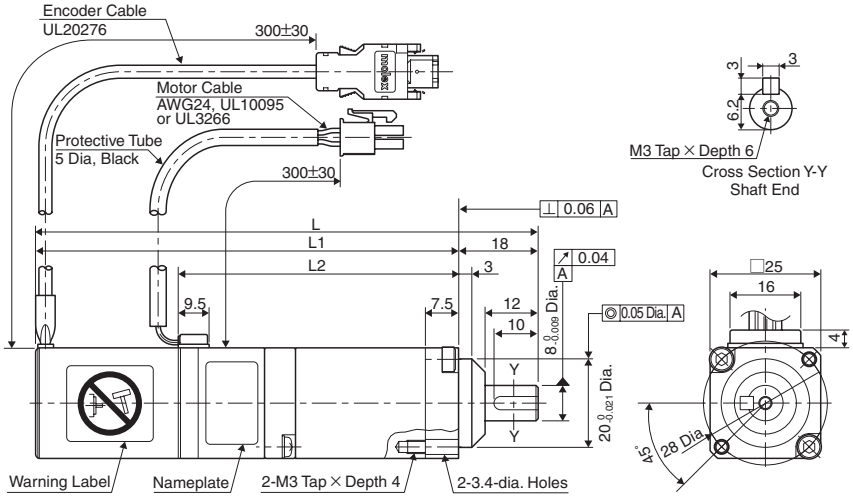
● Allowable Radial and Thrust Loads

Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model SGMMJ-	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
A1B□BJA2□□□	52	47	18	
A1B□BJA6□□□				
A1B□BJB2□□□	76			
A1B□BJB6□□□				
A1B□BJC2□□□	89			
A1B□BJC6□□□				
A2B□BJA2□□□	52			
A2B□BJA6□□□				
A2B□BJB2□□□	76			
A2B□BJB6□□□				
A2B□BJC2□□□	89			
A2B□BJC6□□□				
A3B□BJ12□□	69	59		
A3B□BJ16□□				
A3B□BJ22□□	147			
A3B□BJ26□□				
A3B□BJ32□□	186			
A3B□BJ36□□				

● Without Brakes

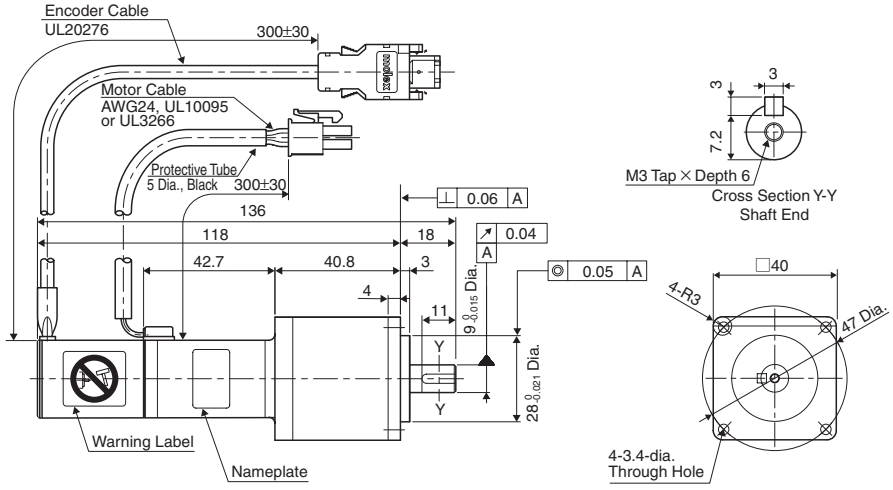
(1) 10 W and 20 W



Model SGMMJ-	L	L1	L2	Key	Tap × Depth	Approx. Mass g
A1B□BJA21□	113.5	95.5	61	None	No tap	240
A1B□BJA61□				Attached	M3×6L	
A1B□BJB21□	124	106	71.5	None	No tap	275
A1B□BJB61□				Attached	M3×6L	
A1B□BJC21□				None	No tap	
A1B□BJC61□				Attached	M3×6L	
A2B□BJA21□	123.5	105.5	71	None	No tap	280
A2B□BJA61□				Attached	M3×6L	
A2B□BJB21□	134	116	81.5	None	No tap	315
A2B□BJB61□				Attached	M3×6L	
A2B□BJC21□				None	No tap	
A2B□BJC61□				Attached	M3×6L	

Note: The key slot conforms to the standard JIS B 1301-1975 (fine class), and the parallel key is attached to it.

(2) 30 W



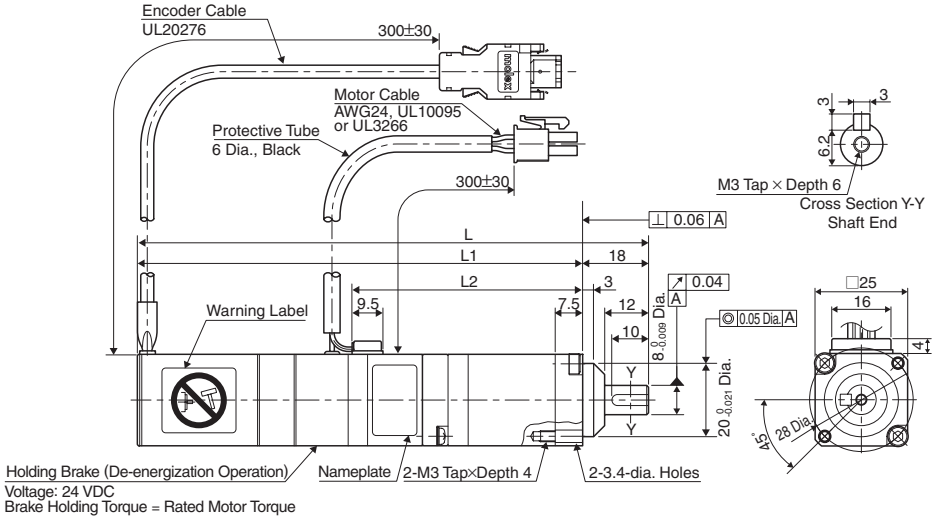
Model SGMMJ-	Key	Tap × Depth	Approx. Mass g
A3B□BJ121□	None	No tap	410
A3B□BJ161□	Attached	M3×6L	
A3B□BJ221□	None	No tap	
A3B□BJ261□	Attached	M3×6L	
A3B□BJ321□	None	No tap	
A3B□BJ361□	Attached	M3×6L	

Note: The key slot conforms to the standard JIS B 1301-1975 (fine class), and the parallel key is attached to it.

With Standard Backlash Gears | External Dimensions Units: mm

● With Brakes

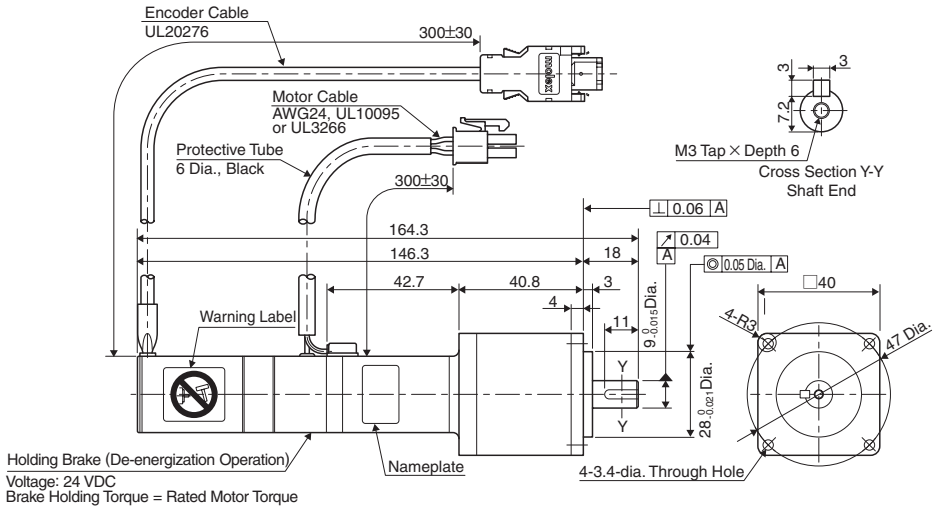
(1) 10 W and 20 W



Model SGMMJ-	L	L1	L2	Key	Tap × Depth	Approx. Mass g
A1B□BJA2C□	142	124	61	None	No tap	325
A1B□BJA6C□				Attached	M3×6L	
A1B□BJB2C□	152.5	134.5	71.5	None	No tap	360
A1B□BJB6C□				Attached	M3×6L	
A1B□BJC2C□				None	No tap	
A1B□BJC6C□				Attached	M3×6L	
A2B□BJA2C□	152	134	71	None	No tap	380
A2B□BJA6C□				Attached	M3×6L	
A2B□BJB2C□	162.5	144.5	81.5	None	No tap	415
A2B□BJB6C□				Attached	M3×6L	
A2B□BJC2C□				None	No tap	
A2B□BJC6C□				Attached	M3×6L	

Note: The key slot conforms to the standard JIS B 1301-1975 (fine class), and the parallel key is attached to it.

(2) 30 W

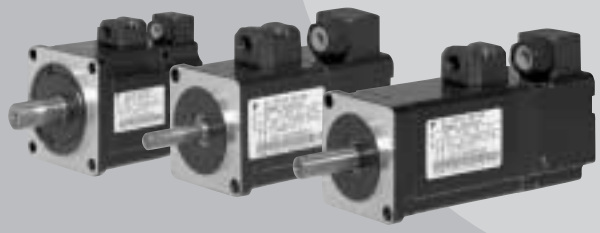


Model SGMMJ-	Key	Tap × Depth	Approx. Mass g
A3B□BJ12C□	None	No tap	555
A3B□BJ16C□	Attached	M3×6L	
A3B□BJ22C□	None	No tap	
A3B□BJ26C□	Attached	M3×6L	
A3B□BJ32C□	None	No tap	
A3B□BJ36C□	Attached	M3×6L	

Notes: 1 The key slot conforms to the standard JIS B 1301-1975 (fine class), and the parallel key is attached to it.
2 The electromagnetic brake is only used to hold the position and cannot be used to stop the servomotor.

Servomotors

SGMAS



Model Designation

●Without Gears

SGMAS - 01 A C A 2 1

(1st+2nd digits) (3rd digit) (4th digit) (5th digit) (6th digit) (7th digit)

Σ-Ⅲ series SGMAS servomotor

1st + 2nd digits Rated Output

Code	Specifications
A5	50 W
01	100 W
C2	150 W
02	200 W
04	400 W
06	600 W
08	750 W
12	1.15 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC

Note: Servomotor is for 200 VAC also when SERVOPACK is for 100 VAC.

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)
C	17-bit incremental encoder (standard)

Note: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
A	Standard

6th digit Shaft End

Code	Specifications
2	Straight without key (standard)
4	Straight with key (optional)
6	Straight with key and tap (optional)
8	Straight with tap (optional)

7th digit Options

Code	Specifications
1	Without options
B	With 90-VDC brakes
C	With 24-VDC brakes
D	With oil seal and 90-VDC brakes
E	With oil seal and 24-VDC brakes
S	With oil seal

Features

- Wide selection: 50 W to 1.15 kW capacity, brake and gear options
- Mounted encoder: 17 bits
- Maximum speed: 6,000 min^{-1}

Application Examples

- Semiconductor equipment
- Chip mounters
- PCB drilling stations
- Robots
- Material handling machines
- Food processing equipment

●With Gears

SGMAS - 01 A C A H 1 2 B

(1st+2nd digits) (3rd digit) (4th digit) (5th digit) (6th digit) (7th digit) (8th digit) (9th digit)

Σ-Ⅲ series SGMAS servomotor

1st + 2nd digits Rated Output

Code	Specifications
A5	50 W
01	100 W
C2	150 W
02	200 W
04	400 W
06	600 W
08	750 W
12	1.15 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC

Note: Servomotor is for 200 VAC also when SERVOPACK is for 100 VAC.

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)
C	17-bit incremental encoder (standard)

Note: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
A	Standard

6th digit Gears

Code	Specifications
H	HDS planetary low-backlash gear
J	Standard backlash gear

7th digit Gear Ratio

Code	Specifications	Applicable Gears
B	1/11	H (-01A to -12A), J (-12A only)
C	1/21	H, J
1	1/5	H, J
2	1/9	H (-A5A only)
3	3/31	J (-A5A to -08A)
7	1/33	H, J

8th digit Shaft End

Code	Specifications	Applicable Gears
0	Flange output type	H
2	Straight without key	H, J
6	Straight with key and tap	H, J
8	Straight with tap	H

9th digit Options

Code	Specifications
1	Without brakes
B	With 90-VDC brakes
C	With 24-VDC brakes

Ratings and Specifications

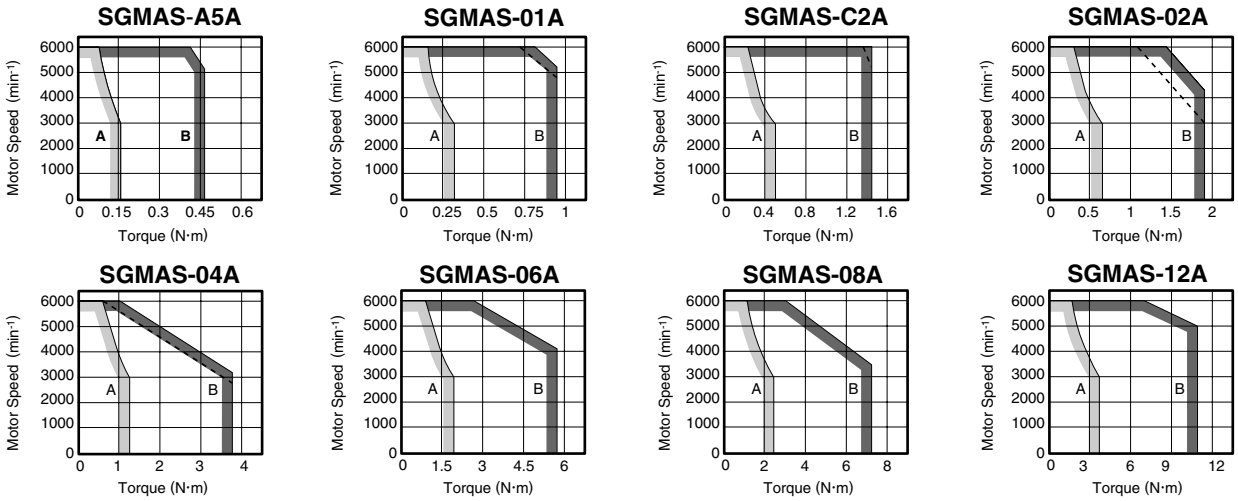
Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method

Thermal Class: B
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

Voltage		200 V							
Servomotor Model: SGMAS-□□□		A5A	01A	C2A	02A	04A	06A	08A	12A
Rated Output*1	W	50	100	150	200	400	600	750	1150
Rated Torque*1,*2	N·m	0.159	0.318	0.477	0.637	1.27	1.91	2.39	3.66
Instantaneous Peak Torque*1	N·m	0.477	0.955	1.43	1.91	3.82	5.73	7.16	11.0
Rated Current*1	Ams	0.66	0.91	1.8	1.9	2.6	4.3	5.4	8.5
Instantaneous Max. Current*1	Ams	2.1	2.8	5.7	6.5	8.5	13.6	16.9	26.0
Rated Speed*1	min^{-1}	3000							
Max. Speed*1	min^{-1}	6000							
Torque Constant	N·m/Arms	0.265	0.375	0.284	0.375	0.527	0.496	0.487	0.467
Rotor Moment of Inertia	$kg·m^2×10^{-4}$	0.0242 (0.0312)	0.0380 (0.0450)	0.0531 (0.0601)	0.116 (0.180)	0.190 (0.254)	0.326 (0.390)	0.769 (0.940)	1.20 (1.42)
Rated Power Rate*1	kW/s	10.4	26.6	42.8	35.0	84.9	112	74.1	112
Rated Angular Acceleration*1	rad/s^2	65800	83800	89900	54900	67000	58600	31000	30500
Applicable SERVOPACK	SGDS-	A5	01	02	02	04	08	08	15

*1: These items and torque-motor speed characteristics quoted in combination with SGDS SERVOPACKs are at an armature winding temperature of 100˚C. Other values quoted at 20˚C.
*2: Rated torques are continuous allowable torque values at 40℃ with an aluminum heat sink of the following dimensions attached.
SGMAS-A5, -01,-C2, -02, -04, and -08: 250 mm×250 mm×6 mm
SGMAS-06: 300 mm×300 mm×12 mm
SGMAS-12: 350 mm×350 mm×12 mm
Note: The values in parentheses are for servomotors with holding brakes.

● Toque-motor Speed Characteristics A Continuous Duty Zone B Intermittent Duty Zone



Note: The dotted line of the intermittent duty zone indicates the characteristics when a servomotor runs in combination with SERVOPACK for 100 VAC.

Ratings and Specifications

● Derating Factor for Servomotor fitted with a Shaft Seal

If a motor is fitted with an oil seal, use the following derating factors because of the higher friction torque.

Servomotor Model SGMAS-	A5A	01A	C2A	02A	04A	06A	08A	12A
Derating Factor %	80	90			95			

● Holding Brake Electrical Specifications

Holding Brake Rated Voltage	Servomotor Model	Servomotor Capacity W	Holding Brake Specifications			
			Capacity W	Holding Torque N·m	Coil Resistance Ω (at 20˚C)	Rated Current A (at 20˚C)
90 VDC	SGMAS-A5A	50	6	0.159	1350	0.066
	SGMAS-01A	100	6	0.318	1350	0.066
	SGMAS-C2A	150	6	0.477	1350	0.066
	SGMAS-02A	200	7.4	0.637	1095	0.082
	SGMAS-04A	400	7.4	1.27	1095	0.082
	SGMAS-06A	600	8.9	1.91	900	0.1
	SGMAS-08A	750	9	2.39	900	0.1
	SGMAS-12A	1150	8.4	3.66	964	0.09
24 VDC	SGMAS-A5A	50	6	0.159	96	0.25
	SGMAS-01A	100	6	0.318	96	0.25
	SGMAS-C2A	150	6	0.477	96	0.25
	SGMAS-02A	200	6.9	0.637	83	0.29
	SGMAS-04A	400	6.9	1.27	83	0.29
	SGMAS-06A	600	8.7	1.91	67	0.36
	SGMAS-08A	750	7.7	2.39	75	0.32
	SGMAS-12A	1150	7.7	3.66	75	0.32

Note: The holding brake is only used to hold the load and cannot be used to stop the servomotor.

● Allowable Load Moment of Inertia at the Motor Shaft

The rotor moment of inertia ratio is the value for a servomotor without a gear and a brake.

Servomotor Model	Capacity Range	Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)
SGMAS	50 W to 200 W	×30
	400 W to 750 W	×20
	1.15 kW	×10

● Load Moment of Inertia

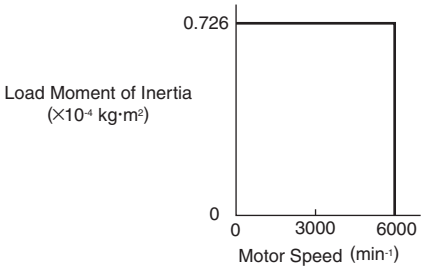
The larger the load moment of inertia, the worse the movement response of the load.
The size of the load moment of inertia (J_L) allowable when using a servomotor depends on motor capacity and is limited to within 5 to 30 times the moment of inertia of each servomotor (J_M). This value is provided strictly as a guideline and results may vary depending on servomotor drive conditions.
An overvoltage alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a regeneration overload alarm (A.320). Take one of the following steps if this occurs.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared. Contact your Yaskawa Application Engineering Department.

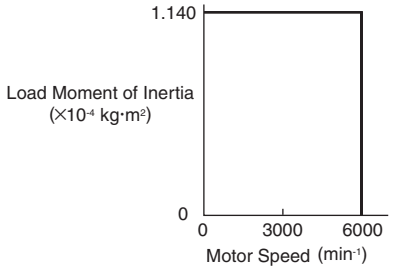
Regenerative resistors are not built into 200 V SERVOPACKs for 50 W to 400 W. The following figures show the tentative relationship between the load moment of inertia and motor speed using an example with a load moment of inertia 10 to 30 times the load moment of inertia at the motor shaft.
External regenerative resistors are required when this condition is exceeded or if the allowable loss capacity (W) of the built-in regenerative resistor is exceeded due to regenerative drive conditions when a regenerative resistor is already built in.

● Load Moment of Inertia and Motor Speed

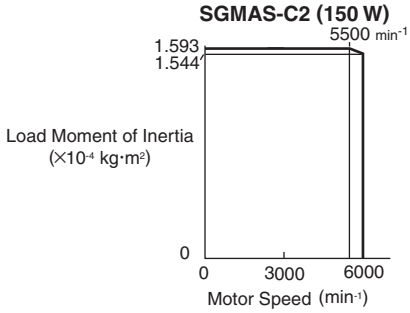
SGMAS-A5 (50 W)



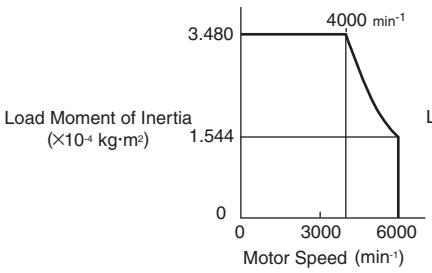
SGMAS-01 (100 W)



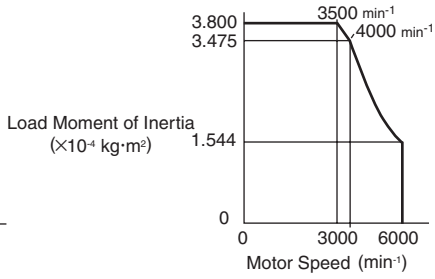
SGMAS-C2 (150 W)



SGMAS-02 (200 W)

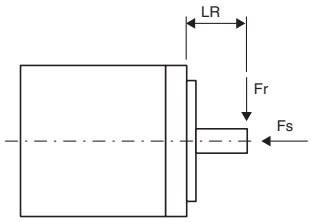


SGMAS-04 (400 W)



● Allowable Radial and Thrust Loads

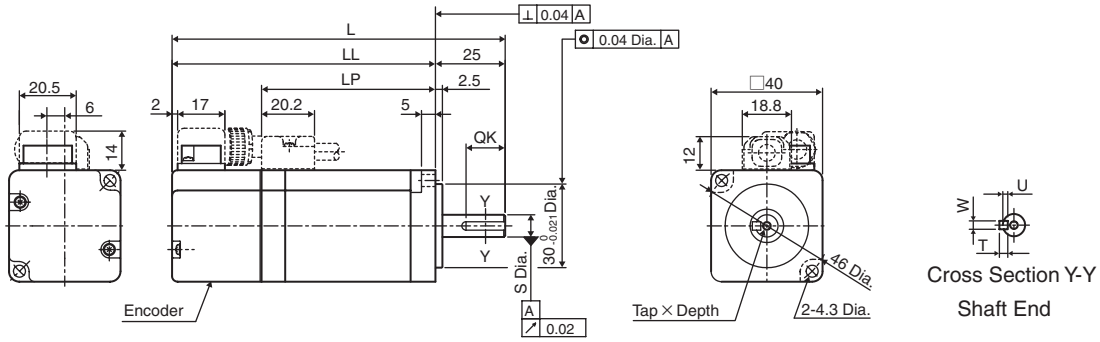
Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model		Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
SGMAS-	A5A	68	54	20	
	01A	78			
	C2A				
	02A	245	74	25	
	04A				
	06A				
	08A	392	147	35	
	12A				

External Dimensions Units: mm

● Without Brakes

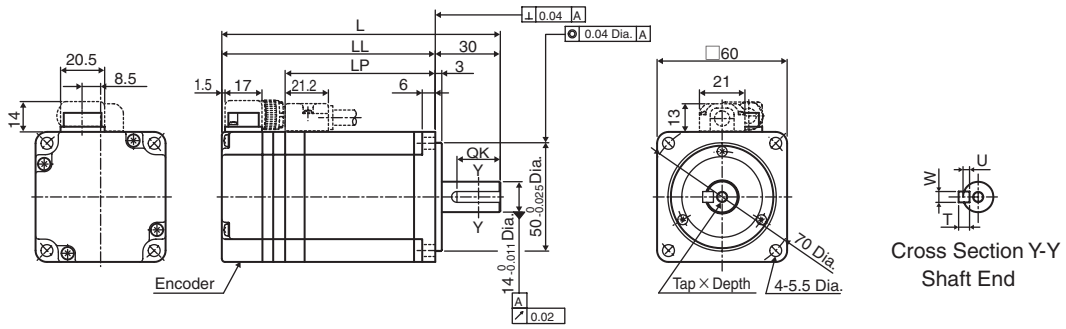
(1) 50 W to 150 W



Model SGMAS-	L	LL	LP	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
A5A□A21	95.5	70.5	38.5	6 0 -0.008	No tap	No key				0.3
A5A□A41						14	1.2	2	2	
A5A□A61					M2.5×5L					
01A□A21	107.5	82.5	50.5	8 0 -0.009	No tap	No key				0.4
01A□A41						14	1.8	3	3	
01A□A61					M3×6L					
C2A□A21	119.5	94.5	62.5	8 0 -0.009	No tap	No key				0.5
C2A□A41						14	1.8	3	3	
C2A□A61					M3×6L					

Note: Refer to page 37 for dimensions of the output shaft for servomotors with oil seals.

(2) 200 W to 600 W



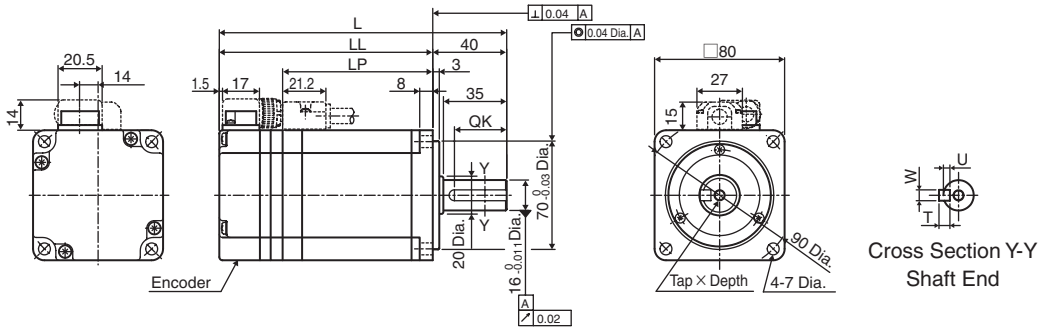
Model SGMAS-	L	LL	LP	Tap × Depth	QK	U	W	T	Approx. Mass kg
02A□A21	110	80	51	No tap	No key				0.9
02A□A41					20	3	5	5	
02A□A61				M5×8L					
04A□A21	128.5	98.5	69.5	No tap	No key				1.2
04A□A41					20	3	5	5	
04A□A61				M5×8L					
06A□A21	154.5	124.5	95.5	No tap	No key				1.7
06A□A41					20	3	5	5	
06A□A61				M5×8L					

Note: Refer to page 37 for dimensions of the output shaft for servomotors with oil seals.

External Dimensions Units: mm

● Without Brakes

(3) 750 W to 1150 W



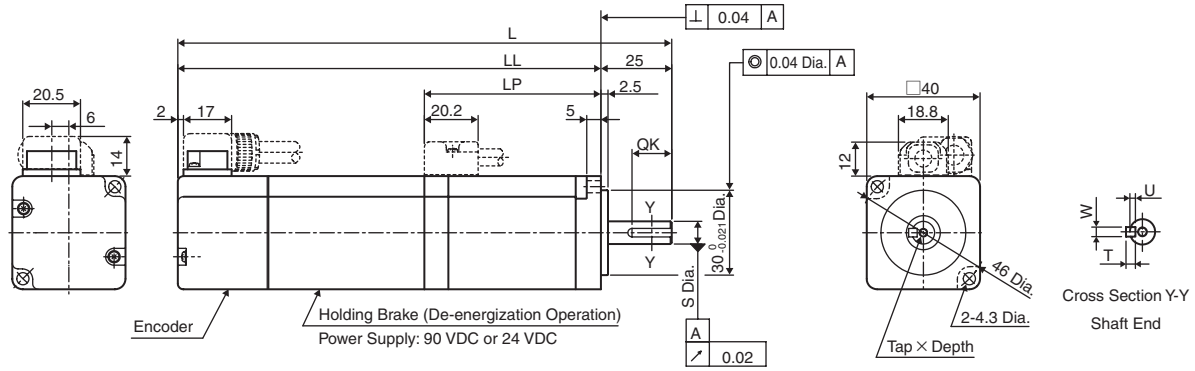
Model SGMAS-	L	LL	LP	Tap × Depth	QK	U	W	T	Approx. Mass kg
08A□A21	155	115	85	No tap	No key				2.3
08A□A41					30	3	5	5	
08A□A61				M5×8L					
12A□A21	186.5	146.5	115	No tap	No key				3.6
12A□A41					30	3	5	5	
12A□A61				M5×8L					

Note: Refer to page 37 for dimensions of the output shaft for servomotors with oil seals.

External Dimensions Units: mm

● With Brakes

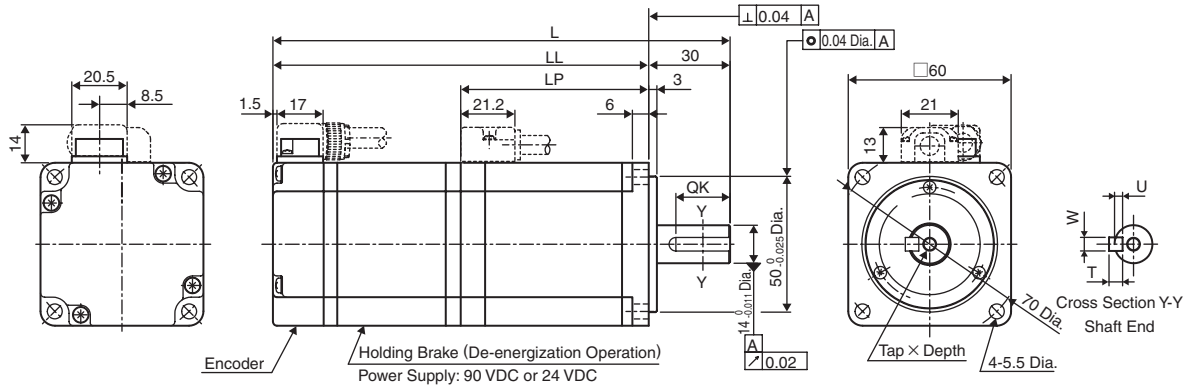
(1) 50 W to 150 W



Model SGMAS-	L	LL	LP	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
A5A□A2□	140.5	115.5	38.5	$6^{0}_{-0.008}$	No tap	No key				0.6
A5A□A4□						14	1.2	2	2	
A5A□A6□					M2.5×5L					
01A□A2□	152.5	127.5	50.5	$8^{0}_{-0.009}$	No tap	No key				0.7
01A□A4□						14	1.8	3	3	
01A□A6□					M3×6L					
C2A□A2□	164.5	139.5	62.5	$8^{0}_{-0.009}$	No tap	No key				0.8
C2A□A4□						14	1.8	3	3	
C2A□A6□					M3× 6L					

Note: Refer to page 37 for dimensions of the output shaft for servomotors with oil seals.

(2) 200 W to 600 W



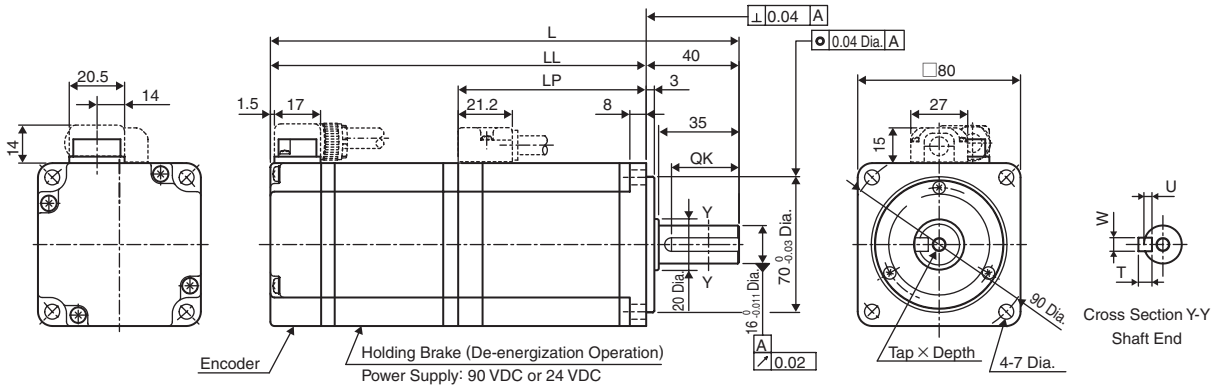
Model SGMAS-	L	LL	LP	Tap × Depth	QK	U	W	T	Approx. Mass kg
02A□A2□	150	120	51	No tap	No key				1.5
02A□A4□					20	3	5	5	
02A□A6□				M5×8L					
04A□A2□	168.5	138.5	69.5	No tap	No key				1.8
04A□A4□					20	3	5	5	
04A□A6□				M5×8L					
06A□A2□	200.5	170.5	95.5	No tap	No key				2.4
06A□A4□					20	3	5	5	
06A□A6□				M5×8L					

Note: Refer to page 37 for dimensions of the output shaft for servomotors with oil seals.

External Dimensions Units: mm

● With Brakes

(3) 750 W to 1150 W



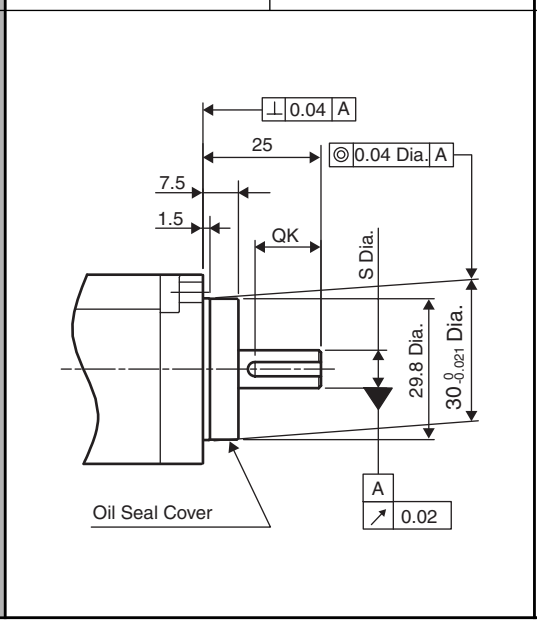
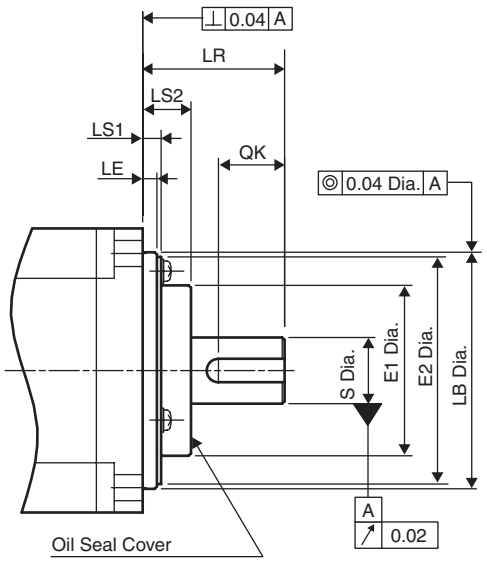
Model SGMAS-	L	LL	LP	Tap × Depth	QK	U	W	T	Approx. Mass kg
08A□A2□	200	160	85	No tap	No key				3.2
08A□A4□					30	3	5	5	
08A□A6□				M5×8L					
12A□A2□	236.5	196.5	115	No tap	No key				4.5
12A□A4□					30	3	5	5	
12A□A6□				M5×8L					

Note: Refer to page 37 for dimensions of the output shaft for servomotors with oil seals.

External Dimensions Units: mm

● Output Shaft of Servomotor with Oil Seal

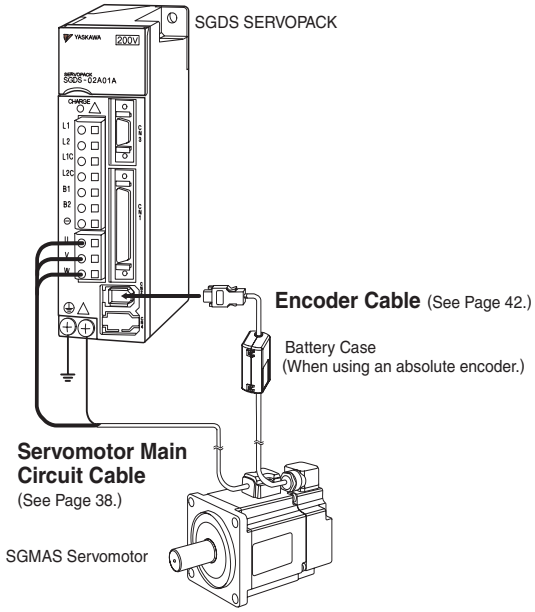
The following table shows the external dimensions of the output shafts for SGMAS servomotors with oil seals. Note that the key length, QK, of the servomotors with oil seals, SGMAS-02 to -12, differs from that of the servomotors without oil seals.

Model		SGMAS-A5,01,C2		SGMAS-02,04,06	SGMAS-08,12
Outer Dimensions		□40		□60	□80
Capacity		50 W	100 W, 150 W	200 W to 600 W	750 W, 1150 W
Output Shaft	S	$6^{0}_{-0.008}$	$8^{0}_{-0.009}$	$14^{0}_{-0.011}$	$16^{0}_{-0.011}$
	E1	–	–	36	49
	E2	–	–	48	66
	LB	–	–	$50^{0}_{-0.025}$	$70^{0}_{-0.03}$
	QK	14	14	14 (20 for servomotors without oil seals)	25 (30 for servomotors without oil seals)
	LE	–	–	3	3
	LS1	–	–	4	6
	LS2	–	–	10	11
	LR	–	–	30	40
Dimensional Drawings					

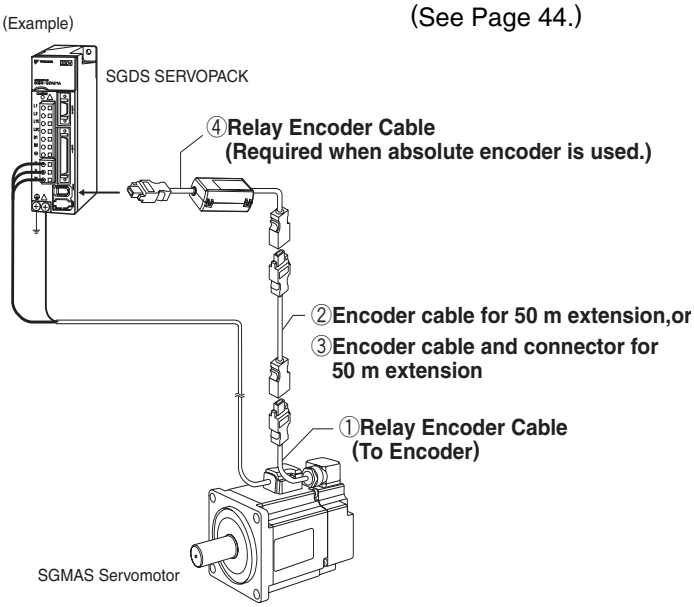
Selecting Cables

● Cables Connections

• For Standard Wiring

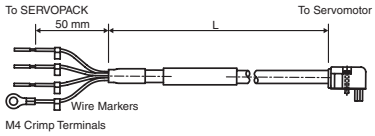
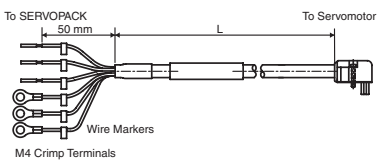


• For Encoder Cable Extensions from 30 m up to 50 m (See Page 44.)



> ⚠ CAUTION
>
> Separate the servomotor main circuit wiring from the I/O signal cable and encoder cable at least 30 cm, and do not bundle or run them in the same duct.

● Servomotor Main Circuit Cables

Name	Servomotor Capacity	Length	Order No.		Specifications	Details
			Standard Cable	Flexible Cable*		
For Servomotors without Brakes	50 W to 150 W	3 m	JZSP-CSM01-03-E	JZSP-CSM21-03-E		(1)
		5 m	JZSP-CSM01-05-E	JZSP-CSM21-05-E		
		10 m	JZSP-CSM01-10-E	JZSP-CSM21-10-E		
		15 m	JZSP-CSM01-15-E	JZSP-CSM21-15-E		
		20 m	JZSP-CSM01-20-E	JZSP-CSM21-20-E		
	200 W to 600 W	3 m	JZSP-CSM02-03-E	JZSP-CSM22-03-E		
		5 m	JZSP-CSM02-05-E	JZSP-CSM22-05-E		
		10 m	JZSP-CSM02-10-E	JZSP-CSM22-10-E		
		15 m	JZSP-CSM02-15-E	JZSP-CSM22-15-E		
		20 m	JZSP-CSM02-20-E	JZSP-CSM22-20-E		
	750 W to 1150 W	3 m	JZSP-CSM03-03-E	JZSP-CSM23-03-E		
		5 m	JZSP-CSM03-05-E	JZSP-CSM23-05-E		
		10 m	JZSP-CSM03-10-E	JZSP-CSM23-10-E		
		15 m	JZSP-CSM03-15-E	JZSP-CSM23-15-E		
		20 m	JZSP-CSM03-20-E	JZSP-CSM23-20-E		
For Servomotors with Brakes	50 W to 150 W	3 m	JZSP-CSM11-03-E	JZSP-CSM31-03-E		(2)
		5 m	JZSP-CSM11-05-E	JZSP-CSM31-05-E		
		10 m	JZSP-CSM11-10-E	JZSP-CSM31-10-E		
		15 m	JZSP-CSM11-15-E	JZSP-CSM31-15-E		
		20 m	JZSP-CSM11-20-E	JZSP-CSM31-20-E		
	200 W to 600 W	3 m	JZSP-CSM12-03-E	JZSP-CSM32-03-E		
		5 m	JZSP-CSM12-05-E	JZSP-CSM32-05-E		
		10 m	JZSP-CSM12-10-E	JZSP-CSM32-10-E		
		15 m	JZSP-CSM12-15-E	JZSP-CSM32-15-E		
		20 m	JZSP-CSM12-20-E	JZSP-CSM32-20-E		
	750 W to 1150 W	3 m	JZSP-CSM13-03-E	JZSP-CSM33-03-E		
		5 m	JZSP-CSM13-05-E	JZSP-CSM33-05-E		
		10 m	JZSP-CSM13-10-E	JZSP-CSM33-10-E		
		15 m	JZSP-CSM13-15-E	JZSP-CSM33-15-E		
		20 m	JZSP-CSM13-20-E	JZSP-CSM33-20-E		

(Cont'd)

Selecting Cables

Name	Servomotor Capacity	Length	Order No. Standard Cable	Order No. Flexible Cable*	Specifications	Details
Connector Kit to Servomotor	50 W to 150 W		JZSP-CSM9-1-E		Caulking (A caulking tool is required.) 	(3)
	200 W to 600 W		JZSP-CSM9-2-E			(4)
	750 W to 1150 W		JZSP-CSM9-3-E			(5)
Cables	50 W to 600 W	5 m	JZSP-CSM90-05-E	JZSP-CSM80-05-E	20 m Max. 	(6)
		10 m	JZSP-CSM90-10-E	JZSP-CSM80-10-E		
		15 m	JZSP-CSM90-15-E	JZSP-CSM80-15-E		
		20 m	JZSP-CSM90-20-E	JZSP-CSM80-20-E		
	750 W to 1150 W	5 m	JZSP-CSM91-05-E	JZSP-CSM81-05-E		(7)
		10 m	JZSP-CSM91-10-E	JZSP-CSM81-10-E		
		15 m	JZSP-CSM91-15-E	JZSP-CSM81-15-E		
		20 m	JZSP-CSM91-20-E	JZSP-CSM81-20-E		

*: Use flexible cables for movable sections such as robot arms.

(1) Wiring for Servomotors without Brakes

Leads to SERVOPACK		Connector to Servomotor	
Wire Color	Signal	Signal	Pin No.
Green/yellow	FG	FG	1
Blue	Phase W	Phase W	2
White	Phase V	Phase V	3
Red	Phase U	Phase U	4
		—	5
		—	6

(2) Wiring for Servomotor with Brakes

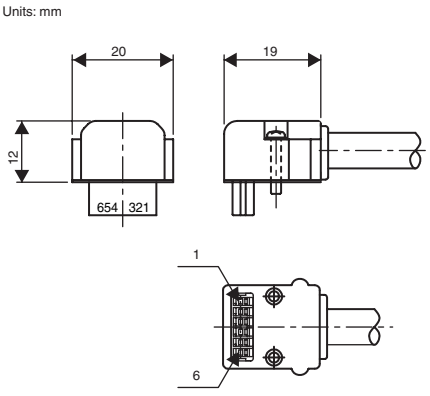
Leads to SERVOPACK		Connector to Servomotor	
Wire Color	Signal	Signal	Pin No.
Green/yellow	FG	FG	1
Blue	Phase W	Phase W	2
White	Phase V	Phase V	3
Red	Phase U	Phase U	4
Black	Brake	Brake	5
Black	Brake	Brake	6

Note: No polarity for connection to a brake

(3) Connector Kits to Servomotor: For 50 W to 150 W Servomotors

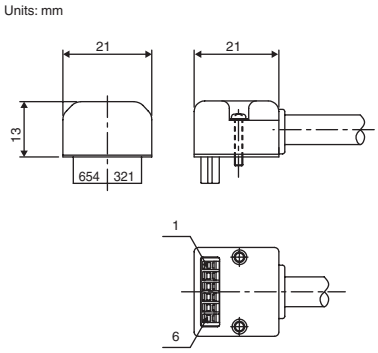
Items		Specifications
Order No.		JZSP-CSM9-1-E
Applicable Servomotors		SGMAS-A5 to -C2
Manufacturer		J.S.T. Mfg. Co., Ltd.
Instruction Manual		JFA Connector J-1700
Receptacle		J17-06FMH-7KL-1
Electrical Contact		SJ1F-01GF-P0.8
Applicable Wire Size		AWG20 to 24
Outer Diameter of Insulating Sheath		1.11 to 1.53 mm
Caulking Tool	Hand tool	YRS-8841
	Applicator	APLMK SJ1F/M-01-08
Mounting Screws		M2 Pan-head screws
Outer Diameter of Applicable Cable		7±0.3 mm

Dimensional Drawings

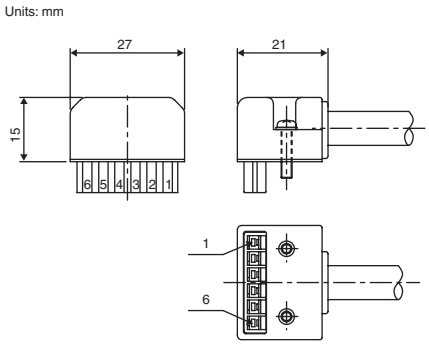


Selecting Cables

(4) Connector Kits to Servomotor: For 200 W to 600 W Servomotors

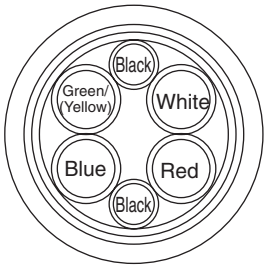
Items		Specifications	Dimensional Drawings
Order No.		JZSP-CSM9-2-E	
Applicable Servomotors		SGMAS-02 to -06	
Manufacturer		J.S.T. Mfg. Co., Ltd.	
Instruction Manual		JFA Connector J-2700	
Receptacle		J27-06FMH-7KL-1	
Electrical Contact		SJ2F-01GF-P1.0	
Applicable Wire Size		AWG20 to 24	
Outer Diameter of Insulating Sheath		1.11 to 1.53 mm	
Caulking Tool	Hand tool	YRS-8861	
	Applicator	APLMK SJ2F/M-01-08	
Mounting Screws		M2 Pan-head screws	
Outer Diameter of Applicable Cable		7±0.3 mm	

(5) Connector Kits to Servomotor: For 750 W to 1150 W Servomotors

Items		Specifications		Dimensional Drawings
Order No.		JZSP-CSM9-3-E		
Applicable Servomotors		SGMAS-08 and -12		
Manufacturer		J.S.T. Mfg. Co., Ltd.		
Instruction Manual		JFA Connector J-3700		
Receptacle		J37-06FMH-8KL-1		
Cable Type		Standard		
Electrical Contact		SJ3F-41GF-P1.8 (For power terminals)	SJ3F-01GF-P1.8 (For brake terminals)	
Applicable Wire Size		AWG16 to 20	AWG20 to 24	
Outer Diameter of Insulating Sheath		1.53 to 2.5 mm	1.11 to 1.86 mm	
Caulking Tool	Hand tool	YRF-880	YRF-881	
	Applicator	APLMK SF3F/M-41-20	APLMK SF3F/M-01-20	
Mounting Screw		M2.5 Pan-head screws		
Outer Diameter of Applicable Cable		8±0.3 mm		

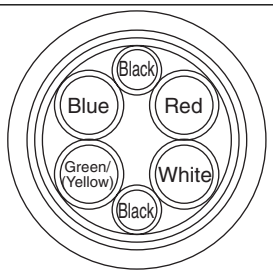
Selecting Cables

(6) Cables: For 50 W to 600 W Servomotors

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CSM90-□□-E (20 m max.)	JZSP-CSM80-□□-E (20 m max.)
Specifications	UL2517 (Max. operating temperature: 105°C) AWG20×6C For power line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.53 mm For brake line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.53 mm	UL2517 (Max. operating temperature: 105°C) AWG22×6C For power line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm For brake line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm
Finished Dimensions	7±0.3 dia. mm	
Internal Configuration and Lead Color		
Yaskawa Standard Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□ of order No.
Example: JZSP-CSM90-05-E (5 m)

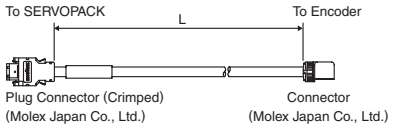
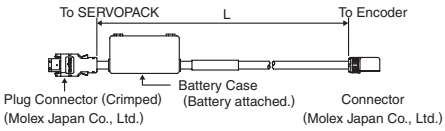
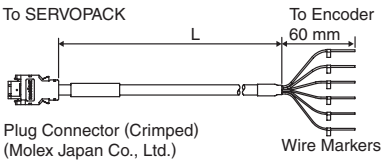
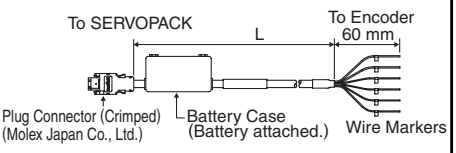
(7) Cables: For 750 W to 1150 W Servomotors

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CSM91-□□-E (20 m max.)	JZSP-CSM81-□□-E (20 m max.)
Specifications	UL2517 (Max. operating temperature: 105°C) AWG16×4C, AWG20×2C For power line: AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.15 mm For brake line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.6 mm	UL2517 (Max. operating temperature: 105°C) AWG16×4C, AWG22×2C For power line: AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.35 mm For brake line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm
Finished Dimensions	8.0±0.3 dia. mm	
Internal Configuration and Lead Color		
Yaskawa Standard Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□of Order No.
Example: JZSP-CSM91-15-E (15 m)

Selecting Cables

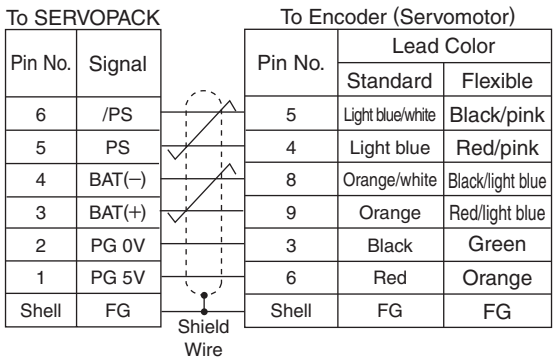
● Encoder Cables and Connectors (For Standard Wiring)

Name	Length	Order No.		Specifications	Details
		Standard Cable	Flexible Cable*		
Encoder Cable with Connectors (For Incremental Encoder)	3 m	JZSP-CSP01-03-E	JZSP-CSP21-03-E		(1)
	5 m	JZSP-CSP01-05-E	JZSP-CSP21-05-E		
	10 m	JZSP-CSP01-10-E	JZSP-CSP21-10-E		
	15 m	JZSP-CSP01-15-E	JZSP-CSP21-15-E		
	20 m	JZSP-CSP01-20-E	JZSP-CSP21-20-E		
(Note) Encoder Cable with Connectors (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP05-03-E	JZSP-CSP25-03-E		(2)
	5 m	JZSP-CSP05-05-E	JZSP-CSP25-05-E		
	10 m	JZSP-CSP05-10-E	JZSP-CSP25-10-E		
	15 m	JZSP-CSP05-15-E	JZSP-CSP25-15-E		
	20 m	JZSP-CSP05-20-E	JZSP-CSP25-20-E		
Encoder Cable with Loose Wires to Encoder (For Incremental Encoder)	3 m	JZSP-CMP03-03-E	JZSP-CMP13-03-E		(3)
	5 m	JZSP-CMP03-05-E	JZSP-CMP13-05-E		
	10 m	JZSP-CMP03-10-E	JZSP-CMP13-10-E		
	15 m	JZSP-CMP03-15-E	JZSP-CMP13-15-E		
	20 m	JZSP-CMP03-20-E	JZSP-CMP13-20-E		
(Note) Encoder Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP04-03-E	JZSP-CSP24-03-E		(4)
	5 m	JZSP-CSP04-05-E	JZSP-CSP24-05-E		
	10 m	JZSP-CSP04-10-E	JZSP-CSP24-10-E		
	15 m	JZSP-CSP04-15-E	JZSP-CSP24-15-E		
	20 m	JZSP-CSP04-20-E	JZSP-CSP24-20-E		
Connector Kit to SERVOPACK		JZSP-CMP9-1-E		Soldered 	(5)
Connector Kit to Encoder		JZSP-CSP9-2-E		Caulking(A caulking tool is required.) 	
Cables	5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	20 m Max. 	(6)
	10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E		
	15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E		
	20 m	JZSP-CMP09-20-E	JZSP-CSP39-20-E		

*: Use flexible cables for movable sections such as robot arms.

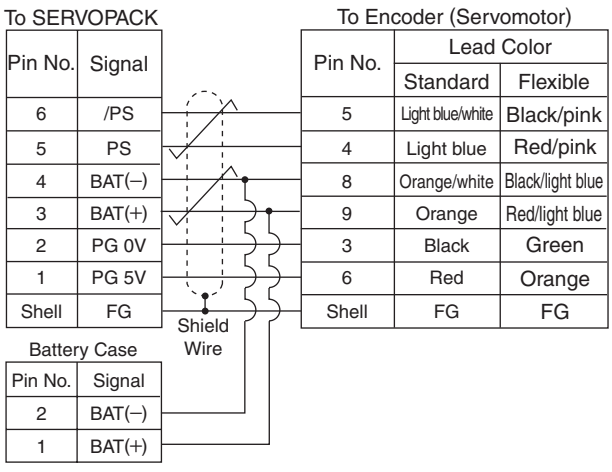
Note: When a battery from the host controller is used for the absolute encoder, no battery case is required. In this case, use a cable designed for incremental encoders.

(1) Wiring for Cable with Connectors (For Incremental Encoder)



To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Pin No.	Lead Color	
			Standard	Flexible
6	/PS	5	Light blue/white	Black/pink
5	PS	4	Light blue	Red/pink
4	BAT(–)	8	Orange/white	Black/light blue
3	BAT(+)	9	Orange	Red/light blue
2	PG 0V	3	Black	Green
1	PG 5V	6	Red	Orange
Shell	FG	Shell	FG	FG

(2) Wiring for Cable with Connectors (For Absolute Encoder, with a Battery Case)



To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Pin No.	Lead Color	
			Standard	Flexible
6	/PS	5	Light blue/white	Black/pink
5	PS	4	Light blue	Red/pink
4	BAT(–)	8	Orange/white	Black/light blue
3	BAT(+)	9	Orange	Red/light blue
2	PG 0V	3	Black	Green
1	PG 5V	6	Red	Orange
Shell	FG	Shell	FG	FG

Battery Case

Pin No.	Signal
2	BAT(–)
1	BAT(+)

Selecting Cables

(3) Wiring for Cable with Loose Wires to Encoder (For Incremental Encoder)

To SERVOPACK

Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

Shield Wire

To Encoder (Servomotor)

Lead Color		Marker
Standard	Flexible	
Light blue/white	Black/pink	6
Light blue	Red/pink	5
Orange/white	Black/light blue	4
Orange	Red/light blue	3
Black	Green	2
Red	Orange	1

Notes: 1 The signals BAT (+) and BAT (-) are used when using an absolute encoder.
2 Be sure to connect the shield wire of encoder cable to the connector case (shell).

(4) Wiring for Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)

To SERVOPACK

Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

Shield Wire

Battery Case

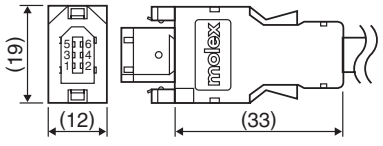
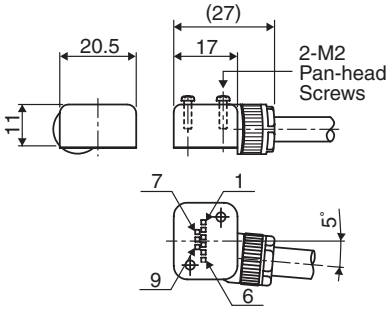
Pin No.	Signal
2	BAT(–)
1	BAT(+)

To Encoder (Servomotor)

Lead Color		Marker
Standard	Flexible	
Lighit blue/white	Black/pink	6
Light blue	Red/pink	5
Orange/white	Black/light blue	4
Orange	Red/light blue	3
Black	Green	2
Red	Orange	1

Note: Be sure to connect the shield wire of encoder cable to the connector case (shell).

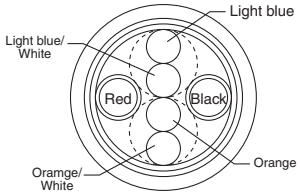
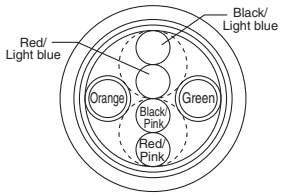
(5) Connector Kits to SERVOPACK

Items	To SERVOPACK	To Servomotor (Encoder)
Order No.	JZSP-CMP9-1-E	JZSP-CSP9-2-E
Manufacturer	Molex Japan Co., Ltd.	Molex Japan Co., Ltd.
Specifications	55100-0670 (soldered) Application Specifications: AS-54280 Crimping Specifications: CS-50639	54346-0070 (caulking)* Mounting screw: M2 pan-head screw (×2) Outer diameter of applicable cable: 6.3 to 7.7 mm Applicabel wire size: AWG22 to 26 Outer diameter of insulating sheath: 1.05 to 1.4 mm Application Specifications: AS-54992 Crimping Specifications: CS-56161
Dimensional Drawings (Units: mm)		

*: A caulking tool is required.
The following caulking tools are applicable for the cables provided by Yaskawa. When using other wire sizes, contact the respective manufacturer for caulking tools.
Applicable caulking tool for Yaskawa's wire size: Hand Tool Model No. 57175-5000
Applicator Model No. 57175-3000

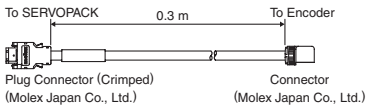
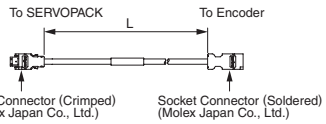
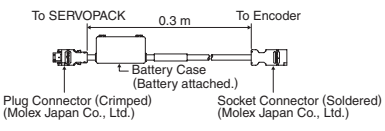
Selecting Cables

(6) Cables

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CMP09-□□-E	JZSP-CSP39-□□-E
Cable Length	20 m max.	
Specifications	UL20276 (Max. operating temperature: 80˚C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.15 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.09 mm	UL20276 (Max. operating temperature: 80˚C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.35 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.21 mm
Finished Dimensions	6.5 dia. mm	6.8 dia. mm
Internal Configuration and Lead Color		
Yaskawa Standards Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

✻: Specify the cable length in □□ of order No.
Example: JZSP-CSM09-05-E (5 m)

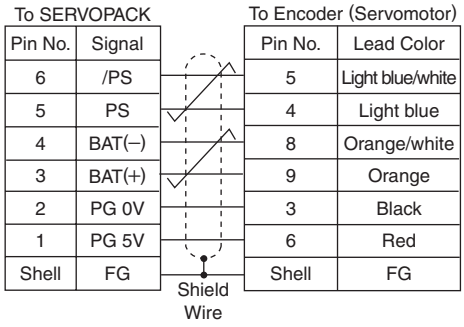
• Encoder Cables and Connectors (For Extending from 30 m up to 50 m)

Name		Length	Order No. Standard Cable	Specifications	Details
① Relay Encoder Cables(for Relay)	For Encoder (Same for Incremental and Absolute Encoders)	0.3 m	JZSP-CSP11-E		(1)
② Encoder cable for 50 m extension	(Same for Incremental and Absolute Encoders)	30 m	JZSP-UCMP00-30-E		(2)
		40 m	JZSP-UCMP00-40-E		
		50 m	JZSP-UCMP00-50-E		
③ Encoder cable and connector for 50 m extension	30 m to 50 m encoder cables are available.	30 m	JZSP-CMP19-30-E	50 m Max. 	(3)
		40 m	JZSP-CMP19-40-E		
		50 m	JZSP-CMP19-50-E		
④ Relay Encoder Cables(for Relay)	For SERVOPACK (For Absolute Encoder, with a Battery Case)	0.3 m	JZSP-CSP12-E*		(4)

✻: Not required if using an incremental encoder or if using an absolute encoder with a battery connected to the host controller.

Selecting Cables

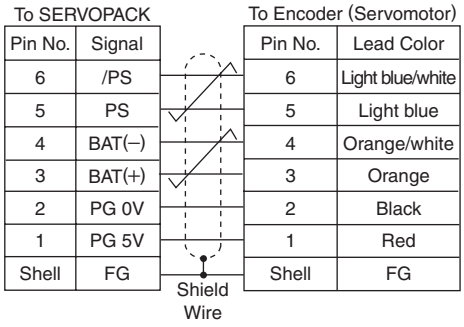
(1) Wiring for Relay Encoder Cable to Encoder
(For Incremental and Absolute Encoders)



Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

Pin No.	Lead Color
5	Light blue/white
4	Light blue
8	Orange/white
9	Orange
3	Black
6	Red
Shell	FG

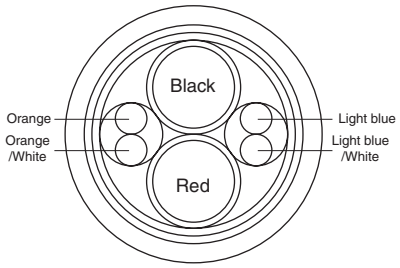
(2) Wiring specification of 50 m encoder cable extension



Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

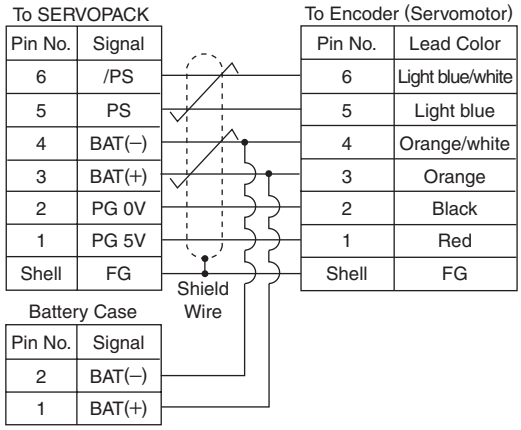
Pin No.	Lead Color
6	Light blue/white
5	Light blue
4	Orange/white
3	Orange
2	Black
1	Red
Shell	FG

(3) Specification of 50 m encoder cable extension

Application	Standard Cable
Order No.*	JZSP-CMP19-□□-E
Cable Length	50 m max.
Specifications	UL20276 (Max. operating temperature: 80˚C) AWG16×2C+AWG26×2P AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.0 mm AWG26 (0.13 mm²) Outer diameter of insulating sheath: 0.91 mm
Finished Dimensions	6.8 dia. mm
Internal Configuration and Lead Colors	
Yaskawa Standard Specifications (Standard Length)	Cable length: 30 m, 40 m, 50 m

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP19-30-E (30 m)

(4) Wiring for Relay Encoder Cable to SERVOPACK
(For Absolute Encoder, with a Battery Case)



Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

Pin No.	Lead Color
6	Light blue/white
5	Light blue
4	Orange/white
3	Orange
2	Black
1	Red
Shell	FG

Pin No.	Signal
2	BAT(–)
1	BAT(+)

With Standard Backlash Gears | Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Gear Mechanism: Planetary gear mechanism
Thermal Class: B

Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 15 to 20 arc-min max.

Servomotor Model SGMAS-	Servomotors			Gears						Moment of Inertia ×10^{-4} kg·m^2	
	Output W	Rated Speed min^{-1}	Rated Torque N·m	Gear Ratio	Lost Motion arc-min	Rated Torque/ Efficiency *2 N·m/%	Instantaneous Peak Torque N·m	Rated Speed min^{-1}	Max. Speed*1 min^{-1}	Motor + Gears	Gears
A5A□AJ1□	50	3000	0.159	1/5	15	0.557/70	1.92	600	800	0.052	0.028
A5A□AJ3□				3/31		1.15/70	3.95	290	387	0.042	0.018
A5A□AJC□				1/21	20	2.67/80	9.07	143	190	0.038	0.014
A5A□AJ7□				1/33		4.20/80	14.3	91	121	0.034	0.010
01A□AJ1□	100	3000	0.318	1/5	15	1.27/80	4.32	600	800	0.101	0.063
01A□AJ3□				3/31		2.63/80	8.88	290	387	0.056	0.018
01A□AJC□				1/21		5.34/80	18.1	143	190	0.073	0.035
01A□AJ7□				1/33		8.40/80	28.4	91	121	0.059	0.021
C2A□AJ1□	150	3000	0.477	1/5	15	1.91/80	5.73	600	800	0.116	0.063
C2A□AJ3□				3/31		3.94/80	11.8	290	387	0.084	0.031
C2A□AJC□				1/21		8.01/80	24.0	143	190	0.088	0.035
C2A□AJ7□				1/33		12.6/80	37.8	91	121	0.097	0.044
02A□AJ1□	200	3000	0.637	1/5	15	2.55/80	8.60	600	800	0.309	0.193
02A□AJ3□				3/31		5.27/80	17.8	290	387	0.206	0.090
02A□AJC□				1/21		10.7/80	36.1	143	190	0.221	0.105
02A□AJ7□				1/33		16.8/80	56.7	91	121	0.191	0.075
04A□AJ1□	400	3000	1.27	1/5	15	5.08/80	17.2	600	800	0.383	0.193
04A□AJ3□				3/31		10.5/80	35.5	290	387	0.370	0.180
04A□AJC□				1/21		21.3/80	72.2	143	190	0.420	0.230
04A□AJ7□				1/33		33.5/80	113	91	121	0.355	0.165
06A□AJ1□	600	3000	1.91	1/5	15	7.6/80	22.8	600	800	0.519	0.193
06A□AJ3□				3/31		15.8/80	47.4	290	387	0.553	0.227
06A□AJC□				1/21		32.1/80	96.3	143	190	0.556	0.230
06A□AJ7□				1/33		50.4/80	151	91	121	0.609	0.283
08A□AJ1□	750	3000	2.39	1/5	15	9.56/80	32.0	600	800	1.22	0.451
08A□AJ3□				3/31		19.8/80	66.6	290	387	1.20	0.431
08A□AJC□				1/21		40.2/80	134	143	190	1.25	0.481
08A□AJ7□				1/33		63.1/80	212	91	121	1.07	0.301
12A□AJ1□	1150	3000	3.66	1/5	15	14.6/80	43.9	600	800	3.00	1.80
12A□AJB□				1/11		32.2/80	96.6	273	363	2.24	1.04
12A□AJC□				1/21		61.5/80	184	143	190	3.10	1.90
12A□AJ7□				1/33		96.6/80	290	91	121	1.82	0.624

*1: Maximum motor speed is up to 4000 min^{-1} at the shaft.
*2: Gear output torque is expressed using the following equation.

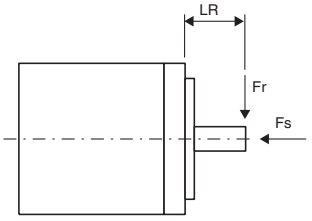
$$\text{(Gear output torque)} = \text{(servomotor output torque)} \times \frac{1}{\text{(gear ratio)}} \times \text{(efficiency)}$$

Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

With Standard Backlash Gears | Ratings and Specifications

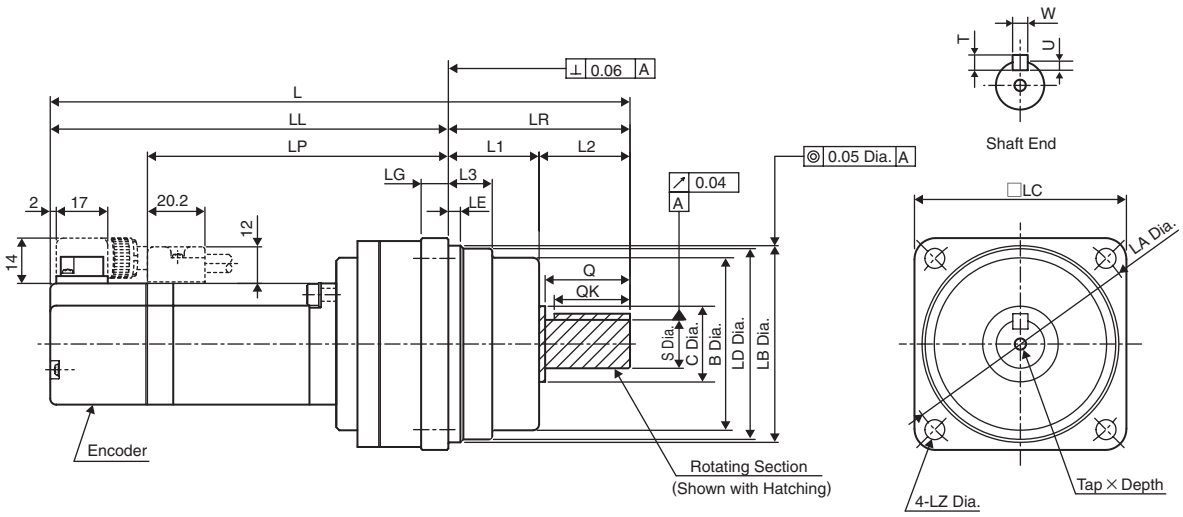
● Allowable Radial and Thrust Loads

Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model SGMAS-	Servomotors with Standard Backlash Gears			
	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
A5A□AJ1□	145	125	50	
A5A□AJ3□	215	145	55	
A5A□AJC□	230			
A5A□AJ7□	245			
01A□AJ1□	175	145	55	
01A□AJ3□	215			
01A□AJC□	455	235	69	
01A□AJ7□	480			
C2A□AJ1□	175	145	55	
C2A□AJ3□	360	235	69	
C2A□AJC□	455			
C2A□AJ7□	635	290	79	
02A□AJ1□	275	235	69	
02A□AJ3□	360			
02A□AJC□	585	290	79	
02A□AJ7□	635			
04A□AJ1□	275	235	69	
04A□AJ3□	460	290	79	
04A□AJC□	655	310	100	
04A□AJ7□	755			
06A□AJ1□	275	235	69	
06A□AJ3□	525	310	100	
06A□AJC□	655			
06A□AJ7□	1205	490	102	
08A□AJ1□	355	290	79	
08A□AJ3□	525	310	100	
08A□AJC□	1070	490	102	
08A□AJ7□	1205			
12A□AJ1□	355	290	79	
12A□AJB□	860	490	102	
12A□AJC□	1070	490		
12A□AJ7□	1690	880	112	

● Without Brakes

(1) 50 W to 150 W

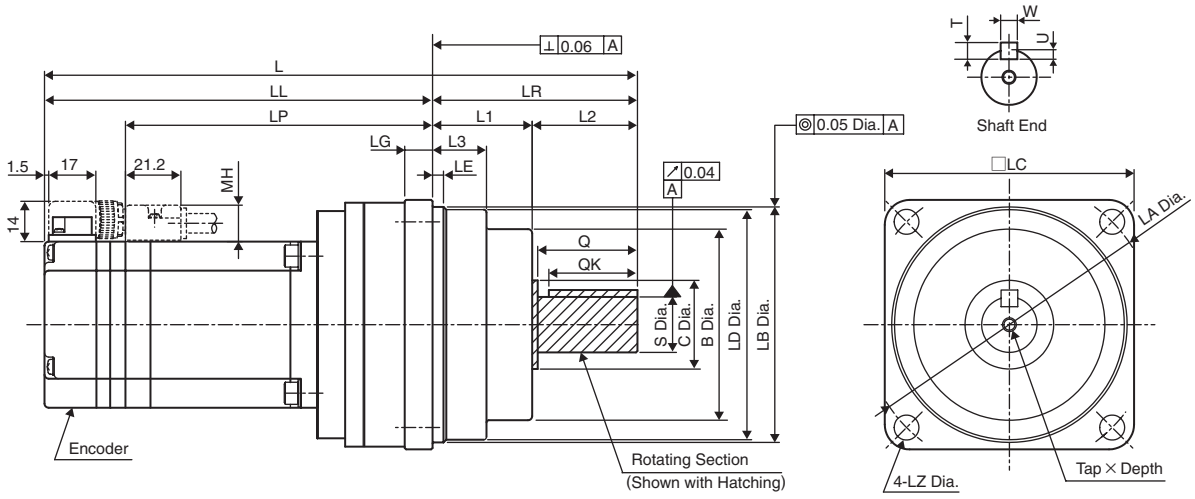


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
A5A□AJ1□1	1/5	157.5	102.5	70.5	55	4	8	47	55.5	$56^{0}_{-0.03}$	60	70	5.5
A5A□AJ3□1	3/31	167.5	107.5	73.5	60		9	57	63	$65^{0}_{-0.03}$	70	80	6.6
A5A□AJC□1	1/21	184.5	124.5	92.5									
A5A□AJ7□1	1/33												
01A□AJ1□1	1/5	179.5	119.5	87.5	60	4	9	57	63	$65^{0}_{-0.03}$	70	80	6.6
01A□AJ3□1	3/31												
01A□AJC□1	1/21	215	141	109	74		10	69	83	$85^{0}_{-0.035}$	90	105	9
01A□AJ7□1	1/33												
C2A□AJ1□1	1/5	191.5	131.5	99.5	60	4	9	57	63	$65^{0}_{-0.03}$	70	80	6.6
C2A□AJ3□1	3/31	210	136	104	74		10	69	83	$85^{0}_{-0.035}$	90	105	9
C2A□AJC□1	1/21	227	153	121									
C2A□AJ7□1	1/33	247.5	163.5	131.5	84		12	82	98	$100^{0}_{-0.035}$	105	120	

Model SGMAS-	L1	L2	L3	Q	C	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
A5A□AJ1□1	28	27	17	25	20	$14^{0}_{-0.018}$	M4×8L	20	3	5	5	0.9
A5A□AJ3□1	30	30	14.5	28	25	$16^{0}_{-0.018}$		25				1.1
A5A□AJC□1												1.2
A5A□AJ7□1												
01A□AJ1□1	30	30	14.5	28	25	$16^{0}_{-0.018}$	M4×8L	25	3	5	5	1.2
01A□AJ3□1												
01A□AJC□1	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	2.0
01A□AJ7□1												
C2A□AJ1□1	30	30	14.5	28	25	$16^{0}_{-0.018}$	M4×8L	25	3	5	5	1.3
C2A□AJ3□1	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	1.8
C2A□AJC□1												2.1
C2A□AJ7□1	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	3.6

With Standard Backlash Gears | External Dimensions Units: mm

(2) 200 W to 1150 W

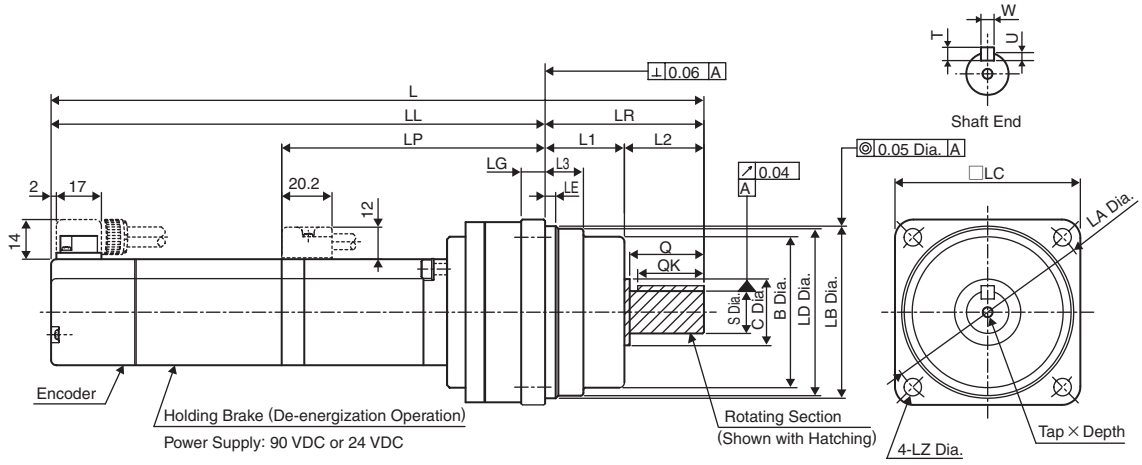


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
02A□AJ1□1	1/5	195.5	121.5	92.5	74	4	10	69	83	$85^{0}_{-0.035}$	90	105	9
02A□AJ3□1	3/31												
02A□AJC□1	1/21	233	149	120	84		12	82	98	$100^{0}_{-0.035}$	105	120	
02A□AJ7□1	1/33												
04A□AJ1□1	1/5	214	140	111	74	4	10	69	83	$85^{0}_{-0.035}$	90	105	9
04A□AJ3□1	3/31	230.5	146.5	117.5	84		12	82	98	$100^{0}_{-0.035}$	105	120	
04A□AJC□1	1/21	279.5	174.5	145.5	105	5	13	93	112	$115^{0}_{-0.035}$	120	135	11
04A□AJ7□1	1/33												
06A□AJ1□1	1/5	240	166	137	74	4	10	69	83	$85^{0}_{-0.035}$	90	105	9
06A□AJ3□1	3/31	280.5	175.5	146.5	105	5	13	93	112	$115^{0}_{-0.035}$	120	135	11
06A□AJC□1	1/21	305.5	200.5	171.5									
06A□AJ7□1	1/33	309.5	202.5	173.5	107	10	15	107	134	$140^{0}_{-0.04}$	145	165	14
08A□AJ1□1	1/5	247	163	133	84	4	12	82	98	$100^{0}_{-0.035}$	105	120	9
08A□AJ3□1	3/31	271	166	136	105	5	13	93	112	$115^{0}_{-0.035}$	120	135	11
08A□AJC□1	1/21	300	193	163	107	10	15	107	134	$140^{0}_{-0.04}$	145	165	14
08A□AJ7□1	1/33												
12A□AJ1□1	1/5	278.5	194.5	163	84	4	12	82	98	$100^{0}_{-0.035}$	105	120	9
12A□AJB□1	1/11	334.5	227.5	227	107	10	15	107	134	$140^{0}_{-0.04}$	145	165	14
12A□AJC□1	1/21	331.5	224.5	193									
12A□AJ7□1	1/33	352.5	235.5	204	117	17	16	135	163	$165^{0}_{-0.04}$	170	190	

Model SGMAS-	L1	L2	L3	Q	C	S	Tap × Depth	QK	U	W	T	MH	Approx. Mass kg
02A□AJ1□1	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	13	2.6
02A□AJ3□1													
02A□AJC□1	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7		4.0
02A□AJ7□1													
04A□AJ1□1	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6		2.9
04A□AJ3□1	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7		3.8
04A□AJC□1	45	60	26.5	58	50	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		5.9
04A□AJ7□1													
06A□AJ1□1	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6		3.4
06A□AJ3□1	45	60	26.5	58	50	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		6
06A□AJC□1													6.4
06A□AJ7□1	44	63	42	60	46	$40^{0}_{-0.025}$	M5×10L	45	5	12	8		11.5
08A□AJ1□1	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	15	4.9
08A□AJ3□1	45	60	26.5	58	50	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		6.5
08A□AJC□1	44	63	42	60	46	$40^{0}_{-0.025}$	M10×20L	45		12			11.3
08A□AJ7□1													
12A□AJ1□1	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	15	6.2
12A□AJB□1	44	63	42	60	46	$40^{0}_{-0.025}$	M10×20L	45	5	12	8		12.6
12A□AJC□1													
12A□AJ7□1	53	64	51		51	$45^{0}_{-0.025}$			5.5	14	9		18.6

● With Brakes

(1) 50 W to 150 W

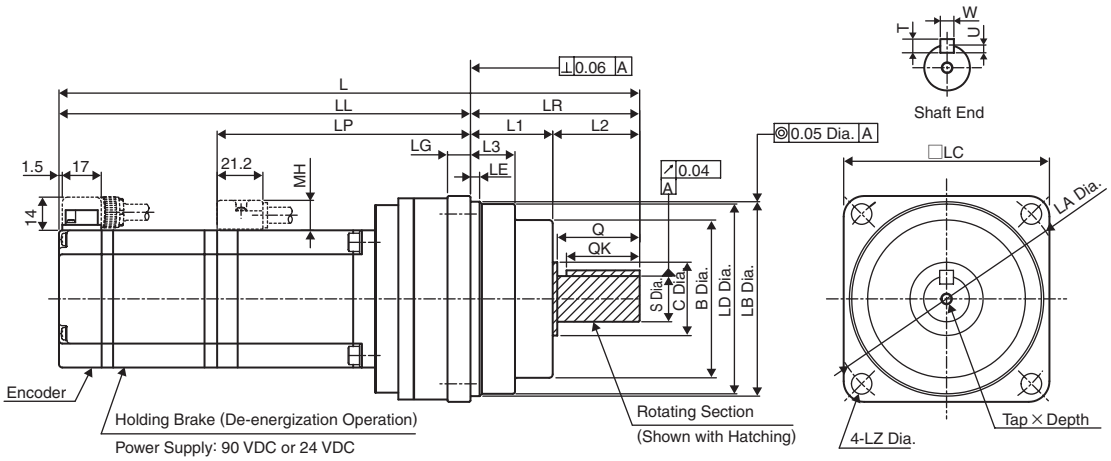


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
A5A□AJ1□□	1/5	202.5	147.5	70.5	55	4	8	47	55.5	$56^{0}_{-0.03}$	60	70	5.5
A5A□AJ3□□	3/31	212.5	152.5	75.5	60		9	57	63	$65^{0}_{-0.03}$	70	80	6.6
A5A□AJC□□	1/21	229.5	169.5	92.5									
A5A□AJ7□□	1/33												
01A□AJ1□□	1/5	224.5	164.5	87.5	60	4	9	57	63	$65^{0}_{-0.03}$	70	80	6.6
01A□AJ3□□	3/31												
01A□AJC□□	1/21	260	186	109	74		10	69	83	$85^{0}_{-0.035}$	90	105	9
01A□AJ7□□	1/33												
C2A□AJ1□□	1/5	236.5	176.5	99.5	60	4	9	57	63	$65^{0}_{-0.03}$	70	80	6.6
C2A□AJ3□□	3/31	255	181	104	74		10	69	83	$85^{0}_{-0.035}$	90	105	9
C2A□AJC□□	1/21	272	198	121									
C2A□AJ7□□	1/33	292.5	208.5	131.5	84		12	82	98	$100^{0}_{-0.035}$	105	120	

Model SGMAS-	L1	L2	L3	Q	C	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
A5A□AJ1□□	28	27	17	25	20	$14^{0}_{-0.018}$	M4×8L	20	3	5	5	1.2
A5A□AJ3□□	30	30	14.5	28	25	$16^{0}_{-0.018}$		25				1.4
A5A□AJC□□												1.5
A5A□AJ7□□												
01A□AJ1□□	30	30	14.5	28	25	$16^{0}_{-0.018}$	M4×8L	25	3	5	5	1.5
01A□AJ3□□												
01A□AJC□□	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	2.6
01A□AJ7□□												
C2A□AJ1□□	30	30	14.5	28	25	$16^{0}_{-0.018}$	M4×8L	25	3	5	5	1.6
C2A□AJ3□□	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	2.5
C2A□AJC□□												2.7
C2A□AJ7□□	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	3.9

With Standard Backlash Gears | External Dimensions Units: mm

(2) 200 W to 1150 W



Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
02A□AJ1□□	1/5	235.5	161.5	92.5	74	4	10	69	83	$85^{0}_{-0.035}$	90	105	9
02A□AJ3□□	3/31												
02A□AJC□□	1/21	273	189	120	84		12	82	98	$100^{0}_{-0.035}$	105	120	
02A□AJ7□□	1/33												
04A□AJ1□□	1/5	254	180	111	74	4	10	69	83	$85^{0}_{-0.035}$	90	105	9
04A□AJ3□□	3/31	270.5	186.5	117.5	84		12	82	98	$100^{0}_{-0.035}$	105	120	
04A□AJC□□	1/21	319.5	214.5	145.5	105	5	13	93	112	$115^{0}_{-0.035}$	120	135	11
04A□AJ7□□	1/33												
06A□AJ1□□	1/5	287.5	213.5	137	74	4	10	69	83	$85^{0}_{-0.035}$	90	105	9
06A□AJ3□□	3/31	328	223	146	84	5	13	93	112	$115^{0}_{-0.035}$	120	135	11
06A□AJC□□	1/21	353	248	171.5	105								
06A□AJ7□□	1/33	357	250	173.5	107	10	15	107	134	$140^{0}_{-0.040}$	145	165	14
08A□AJ1□□	1/5	292	208	133	84	4	12	82	98	$100^{0}_{-0.035}$	105	120	9
08A□AJ3□□	3/31	316	211	136	105	5	13	93	112	$115^{0}_{-0.035}$	120	135	11
08A□AJC□□	1/21	345	238	163	107	10	15	107	134	$140^{0}_{-0.040}$	145	165	14
08A□AJ7□□	1/33												
12A□AJ1□□	1/5	328.5	244.5	163	84	4	12	82	98	$100^{0}_{-0.035}$	105	120	9
12A□AJB□□	1/11	384.5	277.5	227	107	10	15	107	134	$140^{0}_{-0.040}$	145	165	14
12A□AJC□□	1/21	331.5	224.5	193									
12A□AJ7□□	1/33	402.5	285.5	204	117	17	16	135	163	$165^{0}_{-0.040}$	170	190	

Model SGMAS-	L1	L2	L3	Q	C	S	Tap × Depth	QK	U	W	T	MH	Approx. Mass kg
02A□AJ1□□	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	13	3.2
02A□AJ3□□													
02A□AJC□□	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7		4.6
02A□AJ7□□													
04A□AJ1□□	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6		3.5
04A□AJ3□□	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7		4.4
04A□AJC□□	45	60	26.5	58	50	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		6.5
04A□AJ7□□													
06A□AJ1□□	36	38	19.5	36	32	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6		4.1
06A□AJ3□□	45	60	26.5	58	50	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		6.7
06A□AJC□□													7.1
06A□AJ7□□	44	63	42	60	46	$40^{0}_{-0.025}$	M10×20L	45	5	12	8		12.2
08A□AJ1□□	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	15	5.8
08A□AJ3□□	45	60	26.5	58	50	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		7.3
08A□AJC□□	44	63	42	60	46	$40^{0}_{-0.025}$	M10×20L	45		12			12.2
08A□AJ7□□													
12A□AJ1□□	40	44	23	42	40	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	15	7.1
12A□AJB□□	44	63	42	60	46	$40^{0}_{-0.025}$	M10×20L	45	5	12	8		13.5
12A□AJC□□													
12A□AJ7□□	53	64	51		51	$45^{0}_{-0.025}$			5.5	14	9		19.5

With Low-backlash Gears | Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Gear Mechanism: Planetary gear mechanism
Thermal Class: B
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 3 arc-min max.

Servomotor Model SGMAS-	Servomotors			Gears						Moment of Inertia $\times 10^{-4}$ kg·m^2	
	Output W	Rated Speed min^{-1}	Rated Torque N·m	Gear Ratio	Lost Motion arc-min	Rated Torque/ Efficiency *2 N·m/%	Instantaneous Peak Torque N·m	Rated Speed min^{-1}	Max. Speed*1 min^{-1}	Motor + Gears	Gears
A5A□AH1□	50	3000	0.159	1/5	3	0.557/70	1.67	600	800	0.054	0.030
A5A□AH2□				1/9		1.00/70	3.01	333	444	0.052	0.028
A5A□AHC□				1/21		2.67/80	8.02	143	190	0.042	0.019
A5A□AH7□				1/33		4.20/80	12.6	91	121	0.037	0.013
01A□AH1□	100	3000	0.318	1/5	3	1.27/80	3.82	600	800	0.116	0.078
01A□AHB□				1/11		2.80/80	8.41	273	363	0.086	0.048
01A□AHC□				1/21		5.34/80	18.2	143	190	0.081	0.043
01A□AH7□				1/33		8.40/80	28.7	91	121	0.071	0.033
C2A□AH1□	150	3000	0.477	1/5	3	1.91/80	5.73	600	800	0.131	0.078
C2A□AHB□				1/11		4.20/80	12.6	273	363	0.124	0.071
C2A□AHC□				1/21		8.01/80	24.0	143	190	0.096	0.043
C2A□AH7□				1/33		12.6/80	37.8	91	121	0.085	0.032
02A□AH1□	200	3000	0.637	1/5	3	2.55/80	8.4	600	800	0.451	0.335
02A□AHB□				1/11		5.96/85	19.3	273	363	0.201	0.085
02A□AHC□				1/21		11.4/85	37.3	143	190	0.226	0.110
02A□AH7□				1/33		17.9/85	58.6	91	121	0.181	0.065
04A□AH1□	400	3000	1.27	1/5	3	5.40/85	17.6	600	800	0.525	0.335
04A□AHB□				1/11		11.9/85	39.1	273	363	0.385	0.195
04A□AHC□				1/21		22.7/85	72.2	143	190	0.385	0.195
04A□AH7□				1/33		33.5/80	115	91	121	0.363	0.173
06A□AH1□	600	3000	1.91	1/5	3	8.12/85	24.3	600	800	0.661	0.335
06A□AHB□				1/11		17.9/85	53.7	273	363	0.518	0.192
06A□AHC□				1/21		34.1/85	102	143	190	0.904	0.578
06A□AH7□				1/33		50.4/80	151	91	121	0.501	0.173
08A□AH1□	750	3000	2.39	1/5	3	10.2/85	33.3	600	800	1.35	0.583
08A□AHB□				1/11		22.3/85	71.0	273	363	1.30	0.528
08A□AHC□				1/21		42.7/85	140	143	190	1.36	0.593
08A□AH7□				1/33		67.0/85	206	91	121	1.03	0.263
12A□AH1□	1150	3000	3.66	1/5	3	15.6/85	46.7	600	800	1.78	0.583
12A□AHB□				1/11		34.2/85	103	273	363	2.30	1.10
12A□AHC□				1/21		65.3/85	196	143	190	1.79	0.593
12A□AH7□				1/33		96.6/80	290	91	121	2.121	0.921

*1: Maximum motor speed is up to 4000 min^{-1} at the shaft.
*2: Gear output torque is expressed using the following equation.

$$\text{(Gear output torque)} = \text{(servomotor output torque)} \times \frac{1}{\text{(gear ratio)}} \times \text{(efficiency)}$$

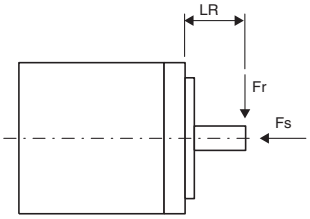
Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

IMPORTANT The SERVOPACK speed control range is 5000:1. When using servomotors at extremely low speeds (0.02 min^{-1} at gear output shaft), or when using servomotors with 1 pulse feed reference for extended periods etc., the gear bearing lubrication may be insufficient. That may cause deterioration of bearing or increase the load ratio. Contact your Yaskawa representative if you are using your servomotor under these conditions.

With Low-backlash Gears | Ratings and Specifications

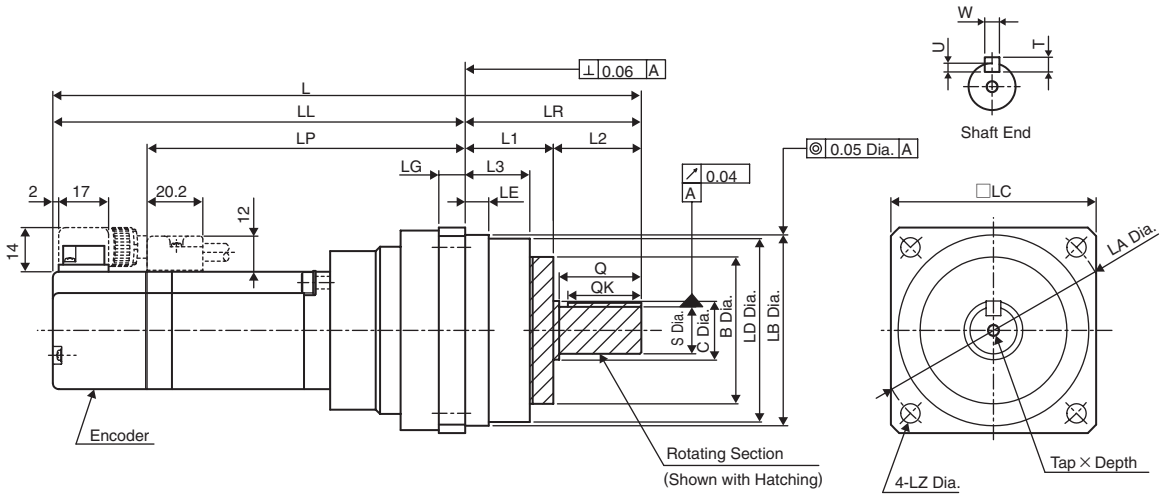
● Allowable Radial and Thrust Loads

Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model SGMAS-	Servomotors with Low-backlash Gears			
	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
A5A□AH1□	137	127	50	
A5A□AH2□	206	147	55	
A5A□AHC□	235			
A5A□AH7□				
01A□AH1□	167	147	55	
01A□AHB□	216			
01A□AHC□	392	235	69	
01A□AH7□	431			
C2A□AH1□	167	147	55	
C2A□AHB□	323	235	69	
C2A□AHC□	392			
C2A□AH7□	608	294	79	
02A□AH1□	245	235	69	
02A□AHB□	323			
02A□AHC□	549	294	79	
02A□AH7□	608			
04A□AH1□	245	235	69	
04A□AHB□	441	294	79	
04A□AHC□	568	314	100	
04A□AH7□	657			
06A□AH1□	245	235	69	
06A□AHB□	451	314	100	
06A□AHC□	568			
06A□AH7□	921	490	137	
08A□AH1□	343	294	79	
08A□AHB□	451	314	100	
08A□AHC□	813	490	137	
08A□AH7□	921			
12A□AH1□	343	294	79	
12A□AHB□	647	490	137	
12A□AHC□	813			
12A□AH7□	1247	882	151	

● Without Brakes

(1) 50 W to 150 W

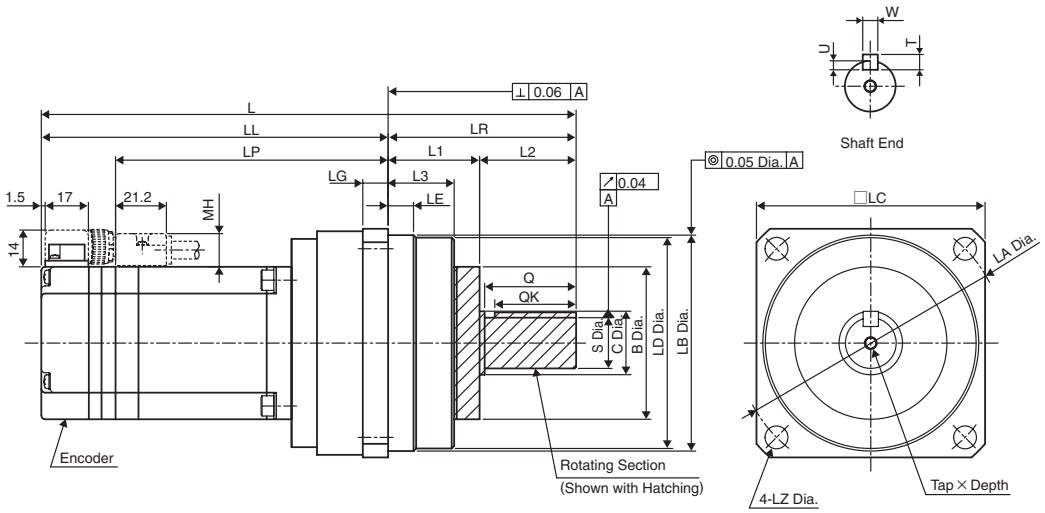


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
A5A□AH1□1	1/5	153.5	98.5	66.5	55	6	8	40	55.5	$56^{0}_{-0.03}$	60	70	5.5
A5A□AH2□1	1/9	159.5	99.5	67.5	60	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6
A5A□AHC□1	1/21	176.5	116.5	84.5				40					
A5A□AH7□1	1/33												
01A□AH1□1	1/5	171.5	111.5	79.5	60	8	9	40	64.5	$65^{0}_{-0.03}$	70	80	6.6
01A□AHB□1	1/11	188.5	128.5	96.5									
01A□AHC□1	1/21	211.5	137.5	105.5	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
01A□AH7□1	1/33												
C2A□AH1□1	1/5	183.5	123.5	91.5	60	8	9	40	64.5	$65^{0}_{-0.03}$	70	80	6.6
C2A□AHB□1	1/11	223.5	149.5	117.5	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
C2A□AHC□1	1/21												
C2A□AH7□1	1/33	229.5	145.5	113.5	84	12	12		96	$100^{0}_{-0.035}$	105	120	

Model SGMAS-	L1	L2	L3	Q	C	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
A5A□AH1□1	28	27	20	25	20	$14^{0}_{-0.018}$	M4×8L	20	3	5	5	0.9
A5A□AH2□1	30	30	22	28		$16^{0}_{-0.018}$		25				1.2
A5A□AHC□1												1.5
A5A□AH7□1												
01A□AH1□1	30	30	22	28	20	$16^{0}_{-0.018}$	M4×8L	25	3	5	5	1.3
01A□AHB□1												1.6
01A□AHC□1	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	2.6
01A□AH7□1												
C2A□AH1□1	30	30	22	28	20	$16^{0}_{-0.018}$	M4×8L	25	3	5	5	1.4
C2A□AHB□1	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	2.9
C2A□AHC□1												2.7
C2A□AH7□1	40	44	29	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	3.2

With Low-backlash Gears | External Dimensions Units: mm

(2) 200 W to 1150 W

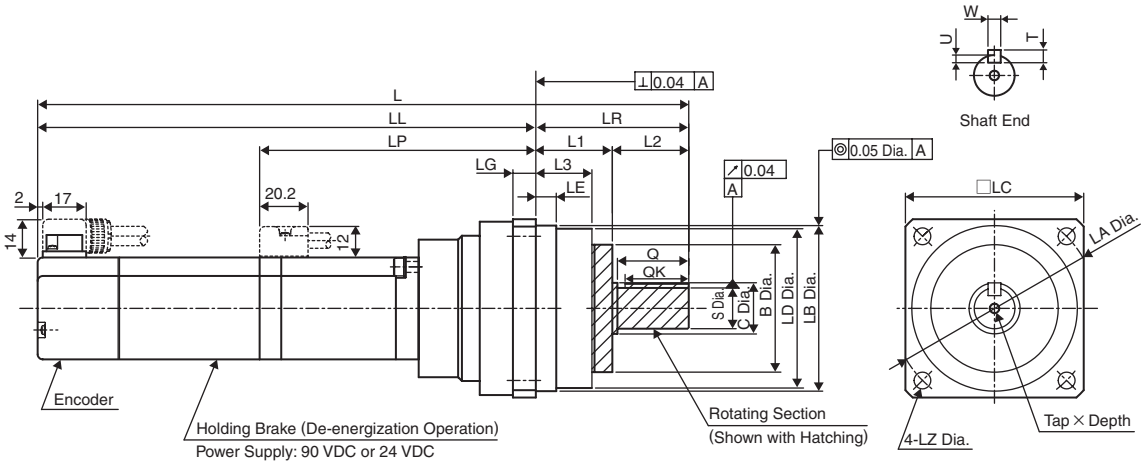


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
02A□AH1□1	1/5	192	118	89	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
02A□AHB□1	1/11	209	135	106									
02A□AHC□1	1/21	227	143	114	84	12	12		96	$100^{0}_{-0.035}$	105	120	
02A□AH7□1	1/33												
04A□AH1□1	1/5	210.5	136.5	107.5	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
04A□AHB□1	1/11	245.5	161.5	132.5	84	12	12		96	$100^{0}_{-0.035}$	105	120	
04A□AHC□1	1/21	274.5	169.5	140.5	105	14	13		112	$115^{0}_{-0.035}$	120	135	11
04A□AH7□1	1/33					12.5		84	114				
06A□AH1□1	1/5	236.5	162.5	133.5	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
06A□AHB□1	1/11	288.5	183.5	154.5	105	14	13		112	$115^{0}_{-0.035}$	120	135	11
06A□AHC□1	1/21	300.5	195.5	166.5		12.5		84	114				
06A□AH7□1	1/33	328.5	186.5	157.5	142	10	15	59	134	$140^{0}_{-0.04}$	145	165	14
08A□AH1□1	1/5	241	157	127	84	12	12		96	$100^{0}_{-0.035}$	105	120	9
08A□AHB□1	1/11	291	186	156	105	14	13		112	$115^{0}_{-0.035}$	120	135	11
08A□AHC□1	1/21	335	193	163	142	10	15	84	134	$140^{0}_{-0.04}$	145	165	14
08A□AH7□1	1/33												
12A□AH1□1	1/5	272.5	188.5	157	84	12	12	59	96	$100^{0}_{-0.035}$	105	120	9
12A□AHB□1	1/11	366.5	224.5	193	142	10	15	84	134	$140^{0}_{-0.04}$	145	165	14
12A□AHC□1	1/21												
12A□AH7□1	1/33	391.5	235.5	204	156	13	16	135	163	$165^{0}_{-0.04}$	170	190	

Model SGMAS -	L1	L2	L3	Q	C	S	Tap × Depth	QK	U	W	T	MH	Approx Mass kg
02A□AH1□1	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	13	2.8
02A□AHB□1													3.3
02A□AHC□1	40	44	30	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7		3.5
02A□AH7□1													3.6
04A□AH1□1	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6		3.1
04A□AHB□1	40	44	30	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7		3.8
04A□AHC□1	45	60	33	58	40	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		4.2
04A□AH7□1													6.6
06A□AH1□1	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6		3.6
06A□AHB□1	45	60	33	58	40	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		4.9
06A□AHC□1													4.7
06A□AH7□1	57	85	42	82	44	$40^{0}_{-0.025}$	M10×20L	70	5	12	8		8.2
08A□AH1□1	40	44	30	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	15	4.7
08A□AHB□1	45	60	34	58	40	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		5.5
08A□AHC□1	57	85	42	82	44	$40^{0}_{-0.025}$	M10×20L	70		12			8.8
08A□AH7□1													
12A□AH1□1	40	44	30	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	15	6.0
12A□AHB□1	57	85	42	82	44	$40^{0}_{-0.025}$	M10×20L	70	5	12	8		10.8
12A□AHC□1													10.1
12A□AH7□1	70	86	51		51	$45^{0}_{-0.025}$			5.5	14	9		19.9

● With Brakes

(1) 50 W to 150 W

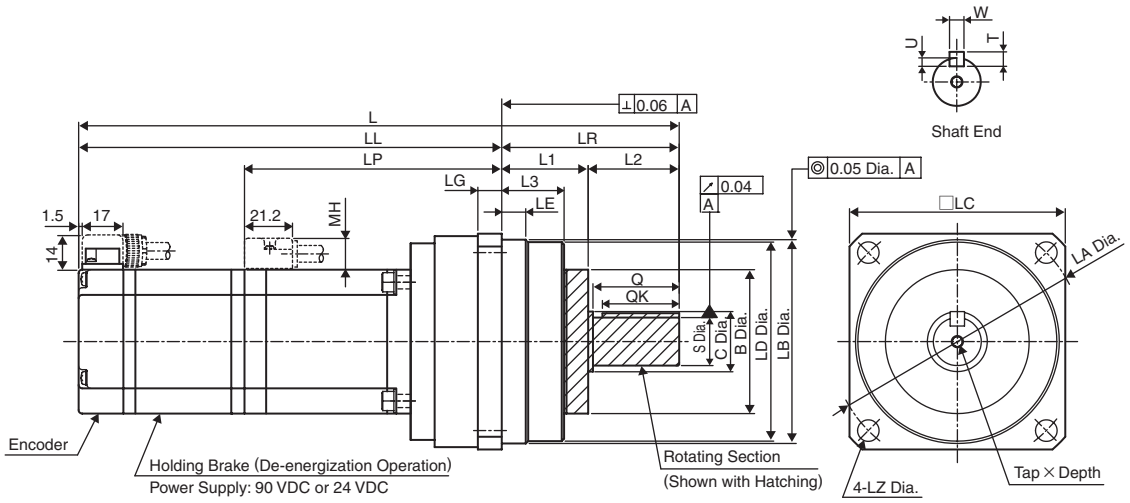


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
A5A□AH1□□	1/5	199.5	144.5	66.5	55	6	8	40	55.5	$56^{0}_{-0.03}$	60	70	5.5
A5A□AH2□□	1/9	205.5	145.5	67.5	60	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6
A5A□AHC□□	1/21	222.5	162.5	84.5				40					
A5A□AH7□□	1/33												
01A□AH1□□	1/5	217.5	157.5	79.5	60	8	9	40	64.5	$65^{0}_{-0.03}$	70	80	6.6
01A□AHB□□	1/11	234.5	174.5	96.5									
01A□AHC□□	1/21	257.5	183.5	105.5	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
01A□AH7□□	1/33												
C2A□AH1□□	1/5	228.5	168.5	91.5	60	8	9	40	64.5	$65^{0}_{-0.03}$	70	80	6.6
C2A□AHB□□	1/11	268.5	194.5	117.5	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
C2A□AHC□□	1/21												
C2A□AH7□□	1/33	274.5	190.5	113.5	84	12	12	59	96	$100^{0}_{-0.035}$	105	120	

Model SGMAS-	L1	L2	L3	Q	C	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
A5A□AH1□□	28	27	20	25	20	$14^{0}_{-0.018}$	M4×8L	20	3	5	5	1.2
A5A□AH2□□	30	30	22	28		$16^{0}_{-0.018}$		25				1.5
A5A□AHC□□												1.8
A5A□AH7□□												
01A□AH1□□	30	30	22	28	20	$16^{0}_{-0.018}$	M4×8L	25	3	5	5	1.6
01A□AHB□□												1.9
01A□AHC□□	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	2.9
01A□AH7□□												
C2A□AH1□□	30	30	22	28	20	$16^{0}_{-0.018}$	M4×8L	25	3	5	5	1.7
C2A□AHB□□	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	3.2
C2A□AHC□□												3.0
C2A□AH7□□	40	44	29	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	3.5

With Low-backlash Gears | External Dimensions Units: mm

(2) 200 W to 1150 W



Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
02A□AH1□□	1/5	232	158	89	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
02A□AHB□□	1/11	249	175	106									
02A□AHC□□	1/21	267	183	114	84	12	12		96	$100^{0}_{-0.035}$	105	120	
02A□AH7□□	1/33												
04A□AH1□□	1/5	250.5	176.5	107.5	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
04A□AHB□□	1/11	285.5	201.5	132.5	84	12	12		96	$100^{0}_{-0.035}$	105	120	
04A□AHC□□	1/21	314.5	209.5	140.5	105	14	13		112	$115^{0}_{-0.035}$	120	135	11
04A□AH7□□	1/33					12.5		84	114				
06A□AH1□□	1/5	284	210	133.5	74	7.5	10	59	84	$85^{0}_{-0.035}$	90	105	9
06A□AHB□□	1/11	334.5	229.5	154.5	105	14	13		112	$115^{0}_{-0.035}$	120	135	11
06A□AHC□□	1/21	348	243	166.5		12.5		84	114				
06A□AH7□□	1/33	376	234	157.5	142	10	15	84	134	$140^{0}_{-0.04}$	145	165	14
08A□AH1□□	1/5	286	202	127	84	12	12	59	96	$100^{0}_{-0.035}$	105	120	9
08A□AHB□□	1/11	336	231	156	105	14	13		112	$115^{0}_{-0.035}$	120	135	11
08A□AHC□□	1/21	380	238	163	142	10	15	84	134	$140^{0}_{-0.04}$	145	165	14
08A□AH7□□	1/33												
12A□AH1□□	1/5	322.5	238.5	157	84	12	12	59	96	$100^{0}_{-0.035}$	105	120	9
12A□AHB□□	1/11	416.5	274.5	193	142	10	15	84	134	$140^{0}_{-0.04}$	145	165	14
12A□AHC□□	1/21												
12A□AH7□□	1/33	441.5	285.5	204	156	13	16	135	163	$165^{0}_{-0.04}$	170	190	

Model SGMAS-	L1	L2	L3	Q	C	S	Tap × Depth	QK	U	W	T	MH	Approx. Mass kg
02A□AH1□□	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6	13	3.4
02A□AHB□□													3.9
02A□AHC□□	40	44	30	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7		4.1
02A□AH7□□													4.2
04A□AH1□□	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6		3.7
04A□AHB□□	40	44	30	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7		4.4
04A□AHC□□	45	60	34	58	40	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		4.8
04A□AH7□□													7.2
06A□AH1□□	36	38	26	36	26	$20^{0}_{-0.021}$	M5×10L	32	3.5	6	6		4.3
06A□AHB□□	45	60	33	58	40	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		5.6
06A□AHC□□													5.4
06A□AH7□□	57	85	46	82	44	$40^{0}_{-0.025}$	M10×20L	70		12			8.9
08A□AH1□□	40	44	30	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	15	5.6
08A□AHB□□	45	60	34	58	40	$32^{0}_{-0.025}$	M8×16L	50	5	10	8		6.4
08A□AHC□□	57	85	42	82	44	$40^{0}_{-0.025}$	M10×20L	70		12			9.7
08A□AH7□□													
12A□AH1□□	40	44	30	42	32	$25^{0}_{-0.021}$	M6×12L	36	4	8	7	15	6.9
12A□AHB□□	57	85	42	82	44	$40^{0}_{-0.025}$	M10×20L	70	5	12	8		11.7
12A□AHC□□													11
12A□AH7□□	70	86	51		51	$45^{0}_{-0.025}$			5.5	14	9		20.8

Flange Output Type With Low-backlash Gears | Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Gear Mechanism: Planetary gear mechanism
Thermal Class: B
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 3 minutes max.

Servomotor Model SGMAS-	Servomotors			Gears						Moment of Inertia $\times 10^{-4}$ kg·m^2	
	Output W	Rated Speed min^{-1}	Rated Torque N·m	Gear Ratio	Lost Motion arc-min	Rated Torque/ Efficiency *2 N·m/%	Instantaneous Peak Torque N·m	Rated Speed min^{-1}	Max. Speed*1 min^{-1}	Motor + Gears	Gears
A5A□AH10	50	3000	0.159	1/5	3	0.557/70	1.92	600	800	0.059	0.035
A5A□AH20				1/9		1.00/70	3.89	333	444	0.056	0.032
A5A□AHC0				1/21		2.67/80	9.07	143	190	0.042	0.018
A5A□AH70				1/33		4.20/80	14.3	91	121	0.035	0.011
01A□AH10	100	3000	0.318	1/5	3	1.27/80	4.32	600	800	0.123	0.085
01A□AHB0				1/11		2.80/80	9.5	273	363	0.079	0.041
01A□AHC0				1/21		5.34/80	18.1	143	190	0.081	0.043
01A□AH70				1/33		8.40/80	27	91	121	0.064	0.026
C2A□AH10	150	3000	0.477	1/5	3	1.91/80	5.73	600	800	0.138	0.085
C2A□AHB0				1/11		4.20/80	12.6	273	363	0.137	0.084
C2A□AHC0				1/21		80.1/80	24.0	143	190	0.096	0.043
C2A□AH70				1/33		12.6/80	37.8	91	121	0.129	0.076
02A□AH10	200	3000	0.637	1/5	3	2.55/80	8.6	600	800	0.396	0.280
02A□AHB0				1/11		5.61/80	18.9	273	363	0.217	0.101
02A□AHC0				1/21		10.7/80	36.1	143	190	0.204	0.088
02A□AH70				1/33		16.8/80	48*3	91	121	0.170	0.054
04A□AH10	400	3000	1.27	1/5	3	5.1/80	17.2	600	800	0.470	0.280
04A□AHB0				1/11		11.2/80	35	273	363	0.417	0.227
04A□AHC0				1/21		21.3/80	72.2	143	190	0.409	0.219
04A□AH70				1/33		33.5/80	93*3	91	121	0.326	0.136
06A□AH10	600	3000	1.91	1/5	3	7.64/80	22.9	600	800	0.606	0.280
06A□AHB0				1/11		16.8/80	50.4	273	363	0.843	0.517
06A□AHC0				1/21		32.1/80	96.3	143	190	0.891	0.565
06A□AH70				1/33		50.4/80	151	91	121	0.647	0.321
08A□AH10	750	3000	2.39	1/5	3	9.56/80	32	600	800	1.39	0.616
08A□AHB0				1/11		21.0/80	56*3	273	363	1.32	0.552
08A□AHC0				1/21		40.2/80	134	143	190	1.32	0.552
08A□AH70				1/33		63.1/80	156*3	91	121	1.10	0.327
12A□AH10	1150	3000	3.66	1/5	3	14.6/80	43.9	600	800	1.76	0.56
12A□AHB0				1/11		32.2/80	96.6	273	363	2.535	1.335
12A□AHC0				1/21		61.5/80	184	143	190	1.726	0.526
12A□AH70				1/33		96.6/80	290	91	121	2.079	0.879

*1: Maximum motor speed is up to 4000 min^{-1} at the shaft.
*2: Gear output torque is expressed using the following equation.

$$\text{(Gear output torque)} = \text{(servomotor output torque)} \times \frac{1}{\text{(gear ratio)}} \times \text{(efficiency)}$$

*3: The instantaneous peak torque values indicated with *3 are limited by the gear, so use the following servomotor instantaneous peak torque. In this case, set torque parameters Pn402 and 403 for the SERVOPACK at 250%.

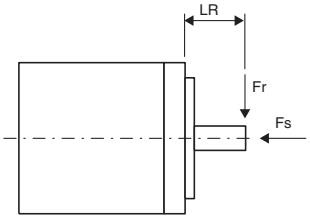
Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

IMPORTANT The SERVOPACK speed control range is 5000:1. When using servomotors at extremely low speeds (0.02 min^{-1} at gear output shaft), or when using servomotors with 1 pulse feed reference for extended periods etc., the gear bearing lubrication may be insufficient. That may cause deterioration of bearing or increase the load ratio. Contact your Yaskawa representative if you are using your servomotor under these conditions.

Flange Output Type With Low-backlash Gears | Ratings and Specifications

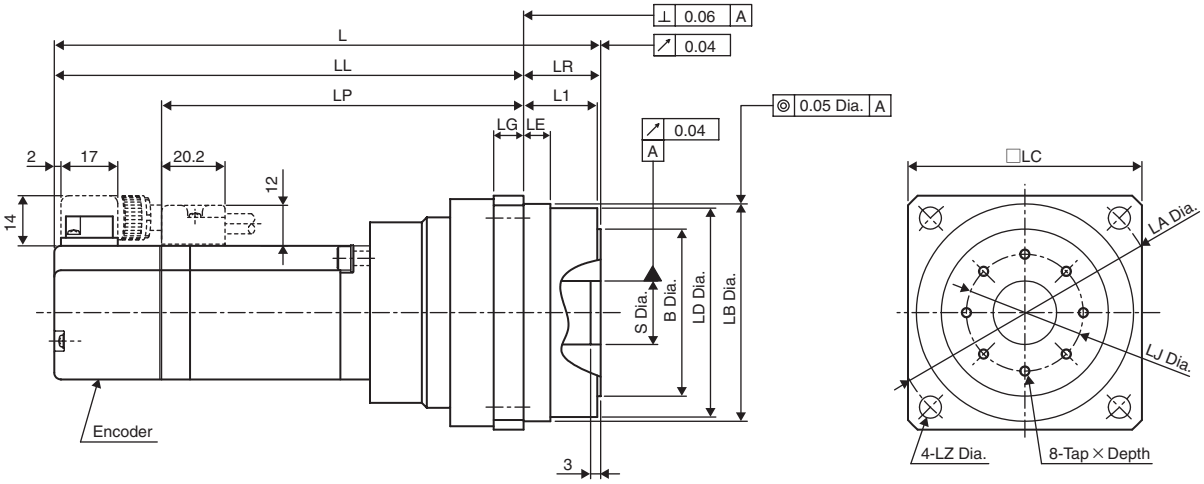
● Allowable Radial and Thrust Loads

Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model SGMAS-	Servomotors with Low-backlash Gears			
	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
A5A□AH10	137	127	50	
A5A□AH20	206	147	55	
A5A□AHC0	235			
A5A□AH70				
01A□AH10	167	147	55	
01A□AHB0	216			
01A□AHC0	392	235	69	
01A□AH70	431			
C2A□AH10	167	147	55	
C2A□AHB0	323	235	69	
C2A□AHC0	392			
C2A□AH70	608	294	79	
02A□AH10	245	235	69	
02A□AHB0	323			
02A□AHC0	549	294	79	
02A□AH70	608			
04A□AH10	245	235	69	
04A□AHB0	441	294	79	
04A□AHC0	568	314	100	
04A□AH70	657			
06A□AH10	245	235	69	
06A□AHB0	451	314	100	
06A□AHC0	568			
06A□AH70	921	490	137	
08A□AH10	343	294	79	
08A□AHB0	451	314	100	
08A□AHC0	813	490	137	
08A□AH70	921			
12A□AH10	343	294	79	
12A□AHB0	647	490	137	
12A□AHC0	813			
12A□AH70	1247	882	151	

● Without Brakes

(1) 50 W to 150 W

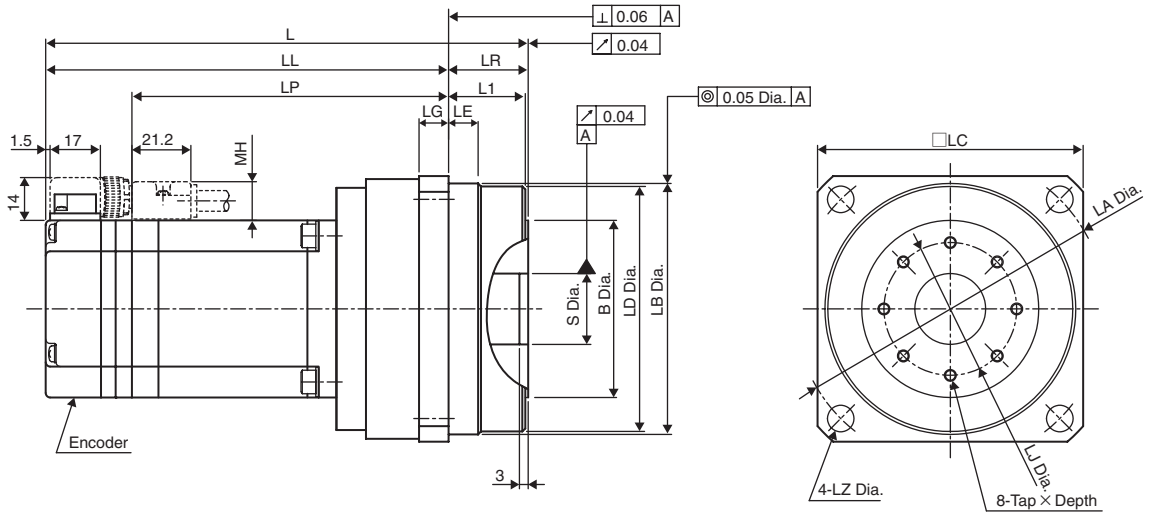


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
A5A□AH101	1/5	119.5	98.5	66.5	21	6	8	40	55.5	$56^{0}_{-0.03}$	60	70	5.5
A5A□AH201	1/9	122.5	99.5	67.5	23	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6
A5A□AHC01	1/21	139.5	116.5	84.5									
A5A□AH701	1/33												
01A□AH101	1/5	134.5	111.5	79.5	23	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6
01A□AHB01	1/11	151.5	128.5	96.5									
01A□AHC01	1/21	164.5	137.5	105.5	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
01A□AH701	1/33												
C2A□AH101	1/5	146.5	123.5	91.5	23	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6
C2A□AHB01	1/11	176.5	149.5	117.5	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
C2A□AHC01	1/21												
C2A□AH701	1/33	188.5	157.5	125.5	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	

Model SGMAS-	L1	S	Tap × Depth	LJ	Approx. Mass kg
A5A□AH101	20	$14^{+0.018}_{0}$	M3×6L	30	0.9
A5A□AH201	22	$19^{+0.021}_{0}$		35	1.1
A5A□AHC01					1.2
A5A□AH701					
01A□AH101	22	$19^{+0.021}_{0}$	M3×6L	35	1.2
01A□AHB01					1.3
01A□AHC01	26	$24^{+0.021}_{0}$	M4×7L	45	2.3
01A□AH701					
C2A□AH101	22	$19^{+0.021}_{0}$	M3×6L	35	1.3
C2A□AHB01	26	$24^{+0.021}_{0}$	M4×7L	45	2.4
C2A□AHC01					
C2A□AH701	29	$28^{+0.021}_{0}$	M5×8L	55	3.5

Flange Output Type With Low-backlash Gears | External Dimensions Units: mm

(2) 200 W to 1150 W

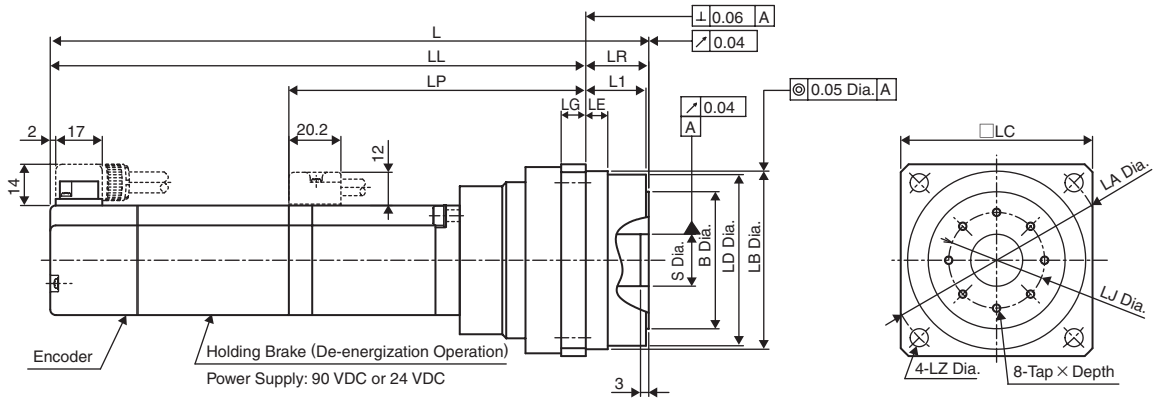


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
02A□AH101	1/5	145	118	89	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
02A□AHB01	1/11	162	135	106									
02A□AHC01	1/21	174	143	114	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	
02A□AH701	1/33												
04A□AH101	1/5	163.5	136.5	107.5	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
04A□AHB01	1/11	192.5	161.5	132.5	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	
04A□AHC01	1/21	204.5	169.5	140.5	35	14	13	90	112	$115^{0}_{-0.035}$	120	135	11
04A□AH701	1/33												
06A□AH101	1/5	189.5	162.5	133.5	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
06A□AHB01	1/11	230.5	195.5	166.5	35	12.5	13	84	114	$115^{0}_{-0.035}$	120	135	11
06A□AHC01	1/21												
06A□AH701	1/33	246.5	202.5	173.5	44	10	15	107	134	$140^{0}_{-0.04}$	145	165	14
08A□AH101	1/5	188	157	127	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	9
08A□AHB01	1/11	221	186	156	35	14	13	90	112	$115^{0}_{-0.035}$	120	135	11
08A□AHC01	1/21	237	193	163	44	10	15	107	134	$140^{0}_{-0.04}$	145	165	14
08A□AH701	1/33												
12A□AH101	1/5	219.5	188.5	157	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	9
12A□AHB01	1/11	271.5	227.5	196	44	10	15	107	134	$140^{0}_{-0.04}$	145	165	14
12A□AHC01	1/21	268.5	224.5	193		16							
12A□AH701	1/33	288.5	235.5	204	53		16	135	163	$165^{0}_{-0.04}$	170	190	

Model SGMAS-	L1	S	Tap × Depth	LJ	MH	Approx. Mass kg
02A□AH101	26	$24^{+0.021}_{0}$	M4×7L	45	13	2.7
02A□AHB01						2.8
02A□AHC01	29	$28^{+0.021}_{0}$	M5×8L	55		3.9
02A□AH701						
04A□AH101	26	$24^{+0.021}_{0}$	M4×7L	45		3.0
04A□AHB01	29	$28^{+0.021}_{0}$	M5×8L	55		4.2
04A□AHC01	33	$32^{+0.025}_{0}$		70		5.6
04A□AH701						
06A□AH101	26	$24^{+0.021}_{0}$	M4×7L	45		3.5
06A□AHB01	33	$32^{+0.025}_{0}$	M5×8L	70		5.9
06A□AHC01						
06A□AH701	42	$35^{+0.025}_{0}$	M6×10L	80		9.9
08A□AH101	29	$28^{+0.021}_{0}$	M5×8L	55	15	5.0
08A□AHB01	33	$32^{+0.025}_{0}$		70		6.7
08A□AHC01	42	$35^{+0.025}_{0}$	M6×10L	80		10.3
08A□AH701						
12A□AH101	29	$28^{+0.021}_{0}$	M5×8L	55	15	6.3
12A□AHB01	42	$35^{+0.025}_{0}$	M6×10L	80		11.6
12A□AHC01						
12A□AH701	51	$47^{+0.025}_{0}$	M8×12L	100		16.9

● With Brakes

(1) 50 W to 150 W

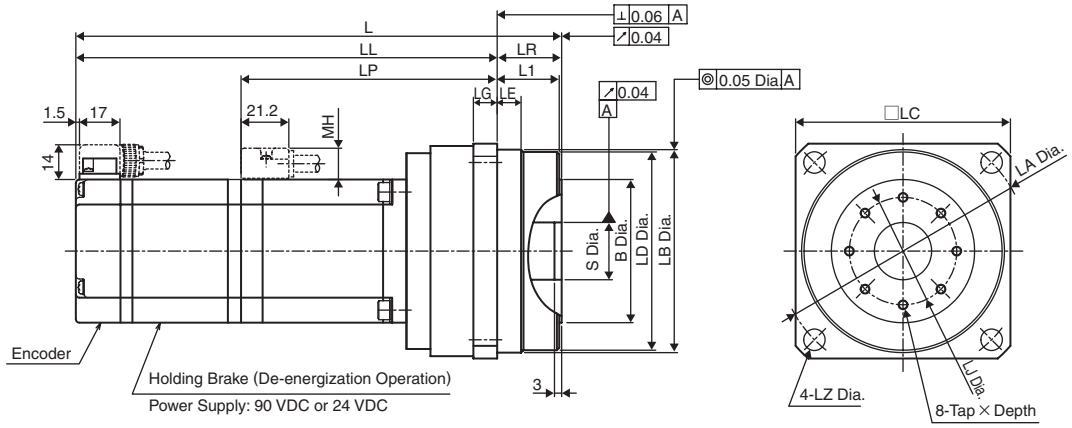


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
A5A□AH10□	1/5	165.5	144.5	66.5	21	6	8	40	55.5	$56^{0}_{-0.03}$	60	70	5.5
A5A□AH20□	1/9	168.5	145.5	67.5	23	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6
A5A□AHC0□	1/21	185.5	162.5	84.5									
A5A□AH70□	1/33												
01A□AH10□	1/5	180.5	157.5	79.5	23	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6
01A□AHB0□	1/11	197.5	174.5	96.5									
01A□AHC0□	1/21	210.5	183.5	105.5	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
01A□AH70□	1/33												
C2A□AH10□	1/5	203.5	168.5	91.5	23	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6
C2A□AHB0□	1/11	233.5	194.5	117.5	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
C2A□AHC0□	1/21												
C2A□AH70□	1/33	245.5	190.5	113.5	31	12	12	76	96	$100^{0}_{-0.035}$	105	120	

Model SGMAS-	L1	S	Tap × Depth	LJ	Approx. Mass kg
A5A□AH10□	20	$14^{+0.018}_{0}$	M3×6L	30	1.2
A5A□AH20□	22	$19^{+0.021}_{0}$		35	1.4
A5A□AHC0□					1.5
A5A□AH70□					
01A□AH10□	22	$19^{+0.021}_{0}$	M3×6L	35	1.5
01A□AHB0□					1.6
01A□AHC0□	26	$24^{+0.021}_{0}$	M4×7L	45	2.6
01A□AH70□					
C2A□AH10□	22	$19^{+0.021}_{0}$	M3×6L	35	1.6
C2A□AHB0□	26	$24^{+0.021}_{0}$	M4×7L	45	2.4
C2A□AHC0□					2.7
C2A□AH70□	29	$28^{+0.021}_{0}$	M5×8L	55	3.5

Flange Output Type With Low-backlash Gears — External Dimensions Units: mm

(2) 200 W to 1150 W

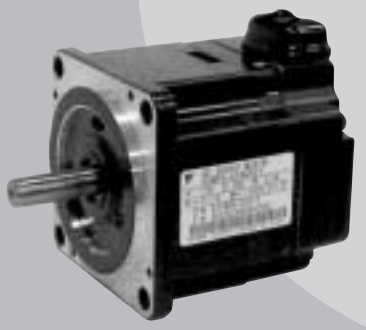


Model SGMAS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ
02A□AH10□	1/5	185	158	89	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
02A□AHB0□	1/11	202	175	106									
02A□AHC0□	1/21	214	183	114	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	
02A□AH70□	1/33												
04A□AH10□	1/5	203.5	176.5	107.5	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
04A□AHB0□	1/11	232.5	201.5	132.5	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	
04A□AHC0□	1/21	244.5	209.5	140.5	35	14	13	90	112	$115^{0}_{-0.035}$	120	135	11
04A□AH70□	1/33												
06A□AH10□	1/5	237	210	133.5	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9
06A□AHB0□	1/11	278	243	166.5	35	12.5	13	84	112	$115^{0}_{-0.035}$	120	135	11
06A□AHC0□	1/21												
06A□AH70□	1/33	294	250	173.5	44	10	15	107	134	$140^{0}_{-0.04}$	145	165	14
08A□AH10□	1/5	233	202	127	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	9
08A□AHB0□	1/11	266	231	156	35	14	13	90	112	$115^{0}_{-0.035}$	120	135	11
08A□AHC0□	1/21	282	238	163	44	10	15	107	134	$140^{0}_{-0.04}$	145	165	14
08A□AH70□	1/33												
12A□AH10□	1/5	269.5	238.5	157	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	9
12A□AHB0□	1/11	321.5	277.5	196	44	10	15	107	134	$140^{0}_{-0.04}$	145	165	44
12A□AHC0□	1/21	363.5	319.5	193		16							
12A□AH70□	1/33	338.5	285.5	204	53		16	135	163	$165^{0}_{-0.04}$	170	190	

Model SGMAS-	L1	S	Tap × Depth	LJ	MH	Approx. Mass kg
02A□AH10□	26	$24^{+0.021}_{0}$	M4×7L	45	13	3.3
02A□AHB0□						3.4
02A□AHC0□	29	$28^{+0.021}_{0}$	M5×8L	55		4.5
02A□AH70□						
04A□AH10□	26	$24^{+0.021}_{0}$	M4×7L	45		3.6
04A□AHB0□	29	$28^{+0.021}_{0}$	M5×8L	55		4.8
04A□AHC0□	33	$32^{+0.025}_{0}$		70		6.2
04A□AH70□						
06A□AH10□	26	$24^{+0.021}_{0}$	M4×7L	45		4.2
06A□AHB0□	33	$32^{+0.025}_{0}$	M5×8L	70		7.0
06A□AHC0□						6.8
06A□AH70□	42	$35^{+0.025}_{0}$	M6×10L	80		10.6
08A□AH10□	29	$28^{+0.021}_{0}$	M5×8L	55	15	5.9
08A□AHB0□	33	$32^{+0.025}_{0}$		70		7.6
08A□AHC0□	42	$35^{+0.025}_{0}$	M6×10L	80		11.2
08A□AH70□						
12A□AH10□	29	$28^{+0.021}_{0}$	M5×8L	55	15	7.2
12A□AHB0□	42	$35^{+0.025}_{0}$	M6×10L	80		12.5
12A□AHC0□						
12A□AH70□	51	$47^{+0.025}_{0}$	M8×12L	100		17.8

Servomotors

SGMPS



Model Designation

●Without Gears

SGMPS - 01 A C A 2 1

(1st+2nd digits) (3rd digit) (4th digit) (5th digit) (6th digit) (7th digit)

Σ-Ⅲ series SGMPS servomotor

1st + 2nd digits Rated Output

Code	Specifications
01	100 W
02	200 W
04	400 W
08	750 W
15	1.5 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC

Note: Servomotor is for 200 VAC also when SERVOPACK is for 100 VAC.

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)
C	17-bit incremental encoder (standard)

Note: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
A	IP55 (standard)
E	IP67 (optional)

6th digit Shaft End

Code	Specifications
2	Straight without key (standard)
4	Straight with key (optional)
6	Straight with key and tap (optional)
8	Straight with tap (optional)

7th digit Options

Code	Specifications
1	Without options
B	With 90-VDC brakes
C	With 24-VDC brakes
D	With oil seal and 90-VDC brakes
E	With oil seal and 24-VDC brakes
S	With oil seal

Features

- Flat type
- Wide selection: 0.1 kW to 1.5 kW capacity, brake and gear options
- Standard protection level: IP55 (IP67 available on request)
- Mounted encoder: 17 bits
- Maximum speed: 6,000 min^{-1}

Application Examples

- Semiconductor equipment
- Chip mounters
- PCB drilling stations
- Robots
- Material handling machines
- Food processing equipment

●With Gears

SGMPS - 01 A 2 A H B 0 1

Σ-Ⅲ series SGMPS servomotor	1st+2nd digits	3rd digit	4th digit	5th digit	6th digit	7th digit	8th digit	9th digit

1st + 2nd digits Rated Output

Code	Specifications
01	100 W
02	200 W
04	400 W
08	750 W
15	1.5 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC

Note: Servomotor is for 200 VAC also when SERVOPACK is for 100 VAC.

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)
C	17-bit incremental encoder (standard)

Note: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
A	IP55 (standard)
E	IP67 (optional)

6th digit Gears

Code	Specifications
H	HDS planetary low-backlash gear
J	Standard backlash gear

7th digit Gear Ratio

Code	Specifications	Applicable Gears
B	1/11	H (-01A to -15A), J (-15A only)
C	1/21	H, J
1	1/5	H, J
3	3/31	J (-01A to -08A)
7	1/33	H, J

8th digit Shaft End

Code	Specifications	Applicable Gears
0	Flange output type	H
2	Straight without key	H, J
6	Straight with key and tap	H, J
8	Straight with tap	H

9th digit Options

Code	Specifications
1	Without brakes
B	With 90-VDC brakes
C	With 24-VDC brakes

Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method

Thermal Class: B
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

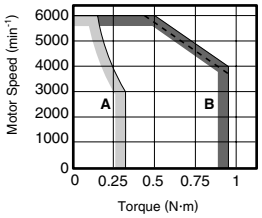
Voltage		200 V				
Servomotor Model SGMPS-□□□		01A	02A	04A	08A	15A
Rated Output*1	W	100	200	400	750	1500
Rated Torque*1,*2	N·m	0.318	0.637	1.27	2.39	4.77
Instantaneous Peak Torque*1	N·m	0.955	1.91	3.82	7.16	14.3
Rated Current*1	Arms	0.86	2.0	2.6	5.4	9.2
Instantaneous Max. Current*1	Arms	2.8	6.4	8.4	16.5	28.0
Rated Speed*1	min^{-1}	3000				
Max. Speed*1	min^{-1}	6000				
Torque Constant	N·m/Arms	0.401	0.361	0.524	0.476	0.559
Rotor Moment of Inertia	$kg·m^2×10^{-4}$	0.0592 (0.0892)	0.263 (0.415)	0.409 (0.561)	2.10 (2.975)	4.02 (4.895)
Rated Power Rate*1	kW/s	17.1	15.4	39.6	27.2	56.6
Rated Angular Acceleration*1	rad/s^2	53700	24200	31100	11400	11900
Applicable SERVOPACK	SGDS-	01	02	04	08	15

*1: These items and torque-motor speed characteristics quoted in combination with SGDS SERVOPACKs are at an armature winding temperature of 100℃. Other values quoted at 20℃.
*2: Rated torques are continuous allowable torque values at 40℃ with the following aluminum heat sink attached.
SGMPS-01, 02, 04: 250 mm×250 mm×6 mm
SGMPS-08, 15: 300 mm×300 mm×12 mm
Note: The values in parentheses are for servomotors with holding brakes.

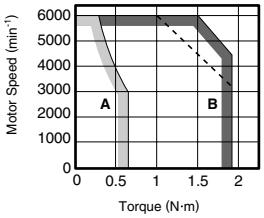
● Torque-motor Speed Characteristics

A Continuous Duty Zone B Intermittent Duty Zone

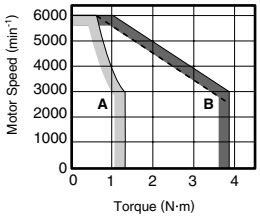
SGMPS-01A



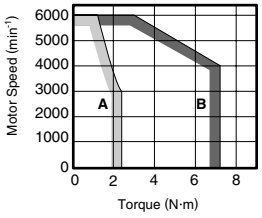
SGMPS-02A



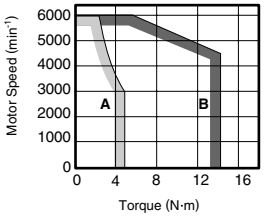
SGMPS-04A



SGMPS-08A



SGMPS-15A



Note: The dotted line of the intermittent duty zone indicates the characteristics when a servomotor runs in combination with a SERVOPACK for 100 VAC.

Ratings and Specifications

● Derating Factor for Servomotor fitted with a Shaft Seal

If a motor is fitted with an oil seal, use the following derating factors because of the higher friction torque.

Servomotor Model SGMPS-	01A	02A	04A	08A	15A
Derating Factor %	90		95		

● Holding Brake Electrical Specifications

Holding Brake Rated Voltage	Servomotor Model	Servomotor Capacity W	Holding Brake Specifications			
			Capacity W	Holding Torque N·m	Coil Resistance Ω (at 20℃)	Rated Current A (at 20℃)
90 VDC	SGMPS-01A	100	8.1	0.318	1000	0.090
	SGMPS-02A	200	7.6	0.637	1066	0.084
	SGMPS-04A	400	7.6	1.27	1066	0.084
	SGMPS-08A	750	7.5	2.39	1083	0.083
	SGMPS-15A	1500	10	4.77	832	0.108
24 VDC	SGMPS-01A	100	8.1	0.318	71.0	0.34
	SGMPS-02A	200	7.6	0.637	75.8	0.32
	SGMPS-04A	400	7.6	1.27	75.8	0.32
	SGMPS-08A	750	7.5	2.39	76.8	0.31
	SGMPS-15A	1500	10	4.77	57.6	0.42

Note: The holding brake is only used to hold the load and cannot be used to stop the servomotor.

● Allowable Load Moment of Inertia at the Motor Shaft

The rotor moment of inertia ratio is the value for a servomotor without a gear and a brake.

Servomotor Model	Capacity Range	Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)
SGMPS	100 W	×25
	200 W	×15
	400 W	×7
	750 W, 1.5 kW	×5

● Load Moment of Inertia

The larger the load moment of inertia, the worse the movement response of the load.

The size of the load moment of inertia (J_L) allowable when using a servomotor depends on motor capacity and is limited to within 5 to 30 times the moment of inertia of each servomotor (J_M). This value is provided strictly as a guideline and results may vary depending on servomotor drive conditions.

An overvoltage alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a regeneration overload alarm (A.320). Take one of the following steps if this occurs.

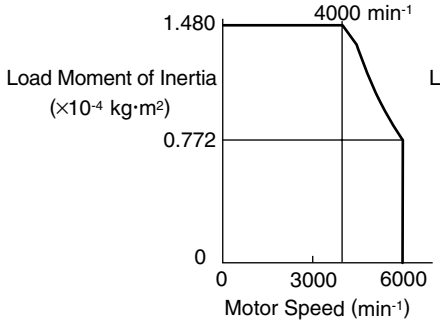
- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared. Contact your Yaskawa Application Engineering Department.

Regenerative resistors are not built into 200 V SERVOPACKs for 100 W to 400 W. The following figures show the tentative relationship between the load moment of inertia and motor speed using an example with a load moment of inertia 10 to 30 times the load moment of inertia at the motor shaft.

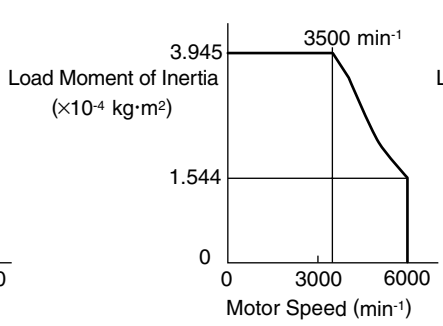
External regenerative resistors are required when this condition is exceeded or if the allowable loss capacity (W) of the built-in regenerative resistor is exceeded due to regenerative drive conditions when a regenerative resistor is already built in.

● Load Moment of Inertia and Motor Speed

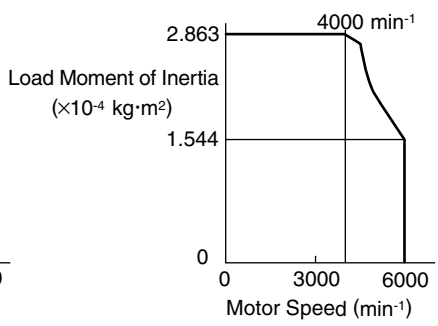
SGMPS-01(100 W)



SGMPS-02(200 W)

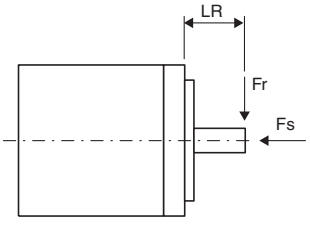


SGMPS-04(400 W)



● Allowable Radial and Thrust Loads

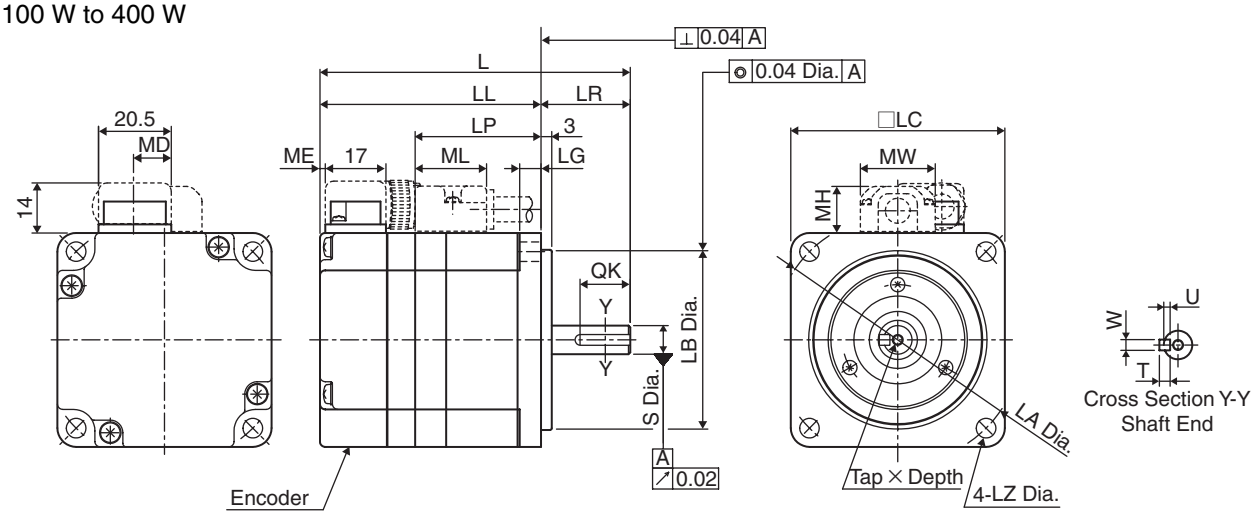
Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model		Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
SGMPS-	01A	78	49	20	
	02A	245	68	25	
	04A				
	08A	392	147	35	
	15A	490			

External Dimensions Units: mm

● Without Brakes

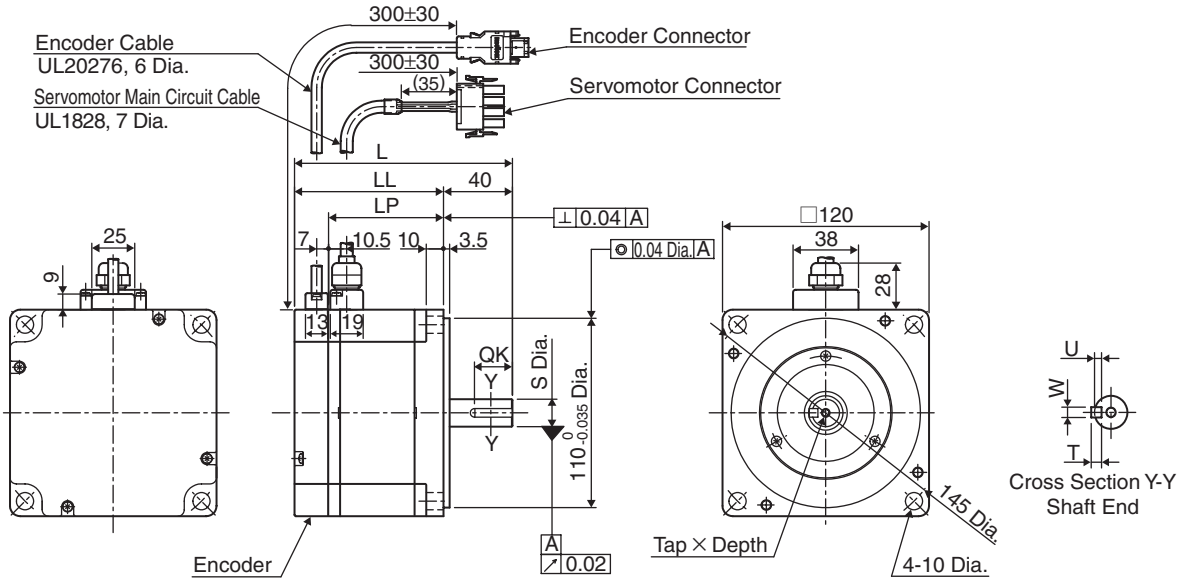
(1) 100 W to 400 W



Model SGMPS-	L	LL	LP	LR	LC	LA	LB	LZ	LG	S	Tap × Depth	QK	U	W	T	MD	ME	MH	ML	MW	Approx. Mass kg
01A□A21	87	62	36	25	60	70	$50^{0}_{-0.025}$	5.5	6	$8^{0}_{-0.009}$	No tap	No key				9	1	12	20	19.8	0.5
01A□A41											M3×6L	14	1.8	3	3						
01A□A61																					
02A□A21	97	67	43	30	80	90	$70^{0}_{-0.03}$	7	8	$14^{0}_{-0.011}$	No tap	No key				14	1.5	13	21	21	1.1
02A□A41											M5×8L	16	3	5	5						
02A□A61																					
04A□A21	107	77	53	30	80	90	$70^{0}_{-0.03}$	7	8	$14^{0}_{-0.011}$	No tap	No key									1.4
04A□A41											M5×8L	16	3	5	5						
04A□A61																					

Note: Refer to page 71 for dimensions of the output shaft for servomotors with oil seals.

(2) 750 W and 1.5 kW



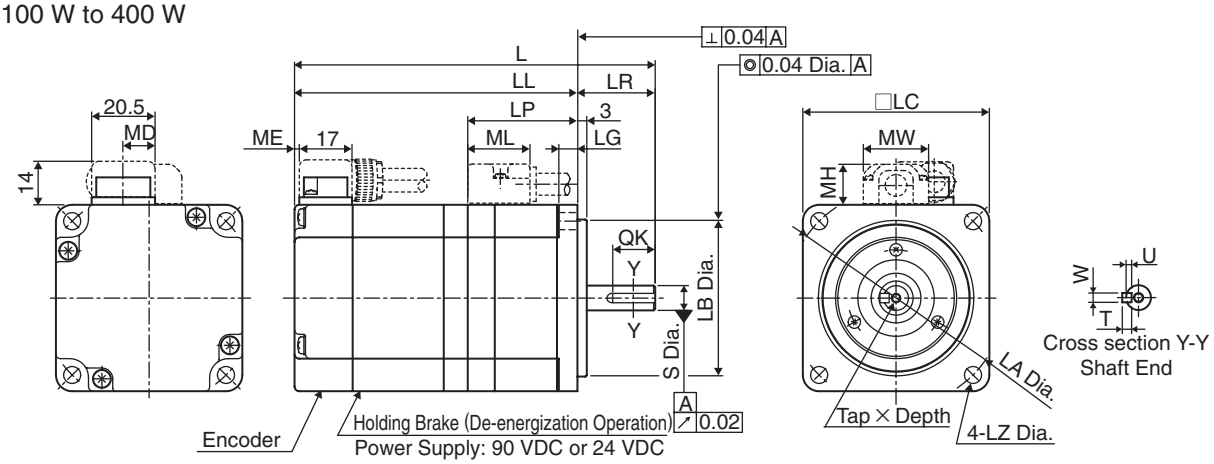
Model SGMPS-	L	LL	LP	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
08A□A21	126.5	86.5	66.7	$16^{0}_{-0.011}$	No tap	No key				4.2
08A□A41						22	3	5	5	
08A□A61					M5×8L					
15A□A21	154.5	114.5	94.7	$19^{0}_{-0.013}$	No tap	No key				6.6
15A□A41						22	3.5	6	6	
15A□A61					M6×10L					

Note: Refer to page 71 for dimensions of the output shaft for servomotors with oil seals.

External Dimensions Units: mm

● With Brakes

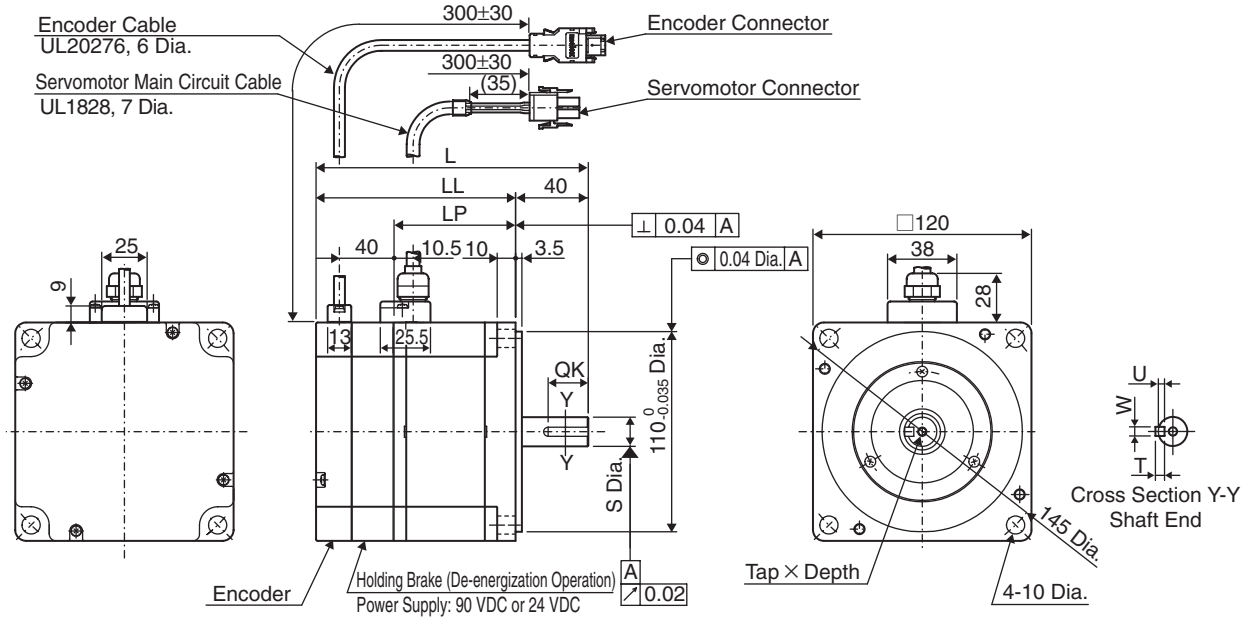
(1) 100 W to 400 W



Model SGMPS-	L	LL	LP	LR	LC	LA	LB	LZ	LG	S	Tap × Depth	QK	U	W	T	MD	ME	MH	ML	MW	Approx. Mass kg
01A□A2□	115	90	36	25	60	70	$50^{0}_{-0.025}$	5.5	6	$8^{0}_{-0.009}$	No tap	No key				9	1	12	20	19.8	0.7
01A□A4□												14	1.8	3	3						
01A□A6□											M3×6L										
02A□A2□	128.5	98.5	43	30	80	90	$70^{0}_{-0.03}$	7	8	$14^{0}_{-0.011}$	No tap	No key				14	1.5	13	21	21	1.6
02A□A4□												16	3	5	5						
02A□A6□											M5×8L										
04A□A2□	138.5	108.5	53	30	80	90	$70^{0}_{-0.03}$	7	8	$14^{0}_{-0.011}$	No tap	No key									1.9
04A□A4□												16	3	5	5						
04A□A6□											M5×8L										

Note: Refer to page 71 for dimensions of the output shaft for servomotors with oil seals.

(2) 750 W and 1.5 kW



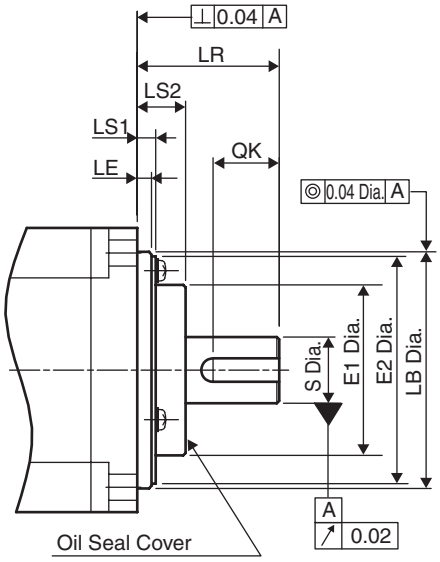
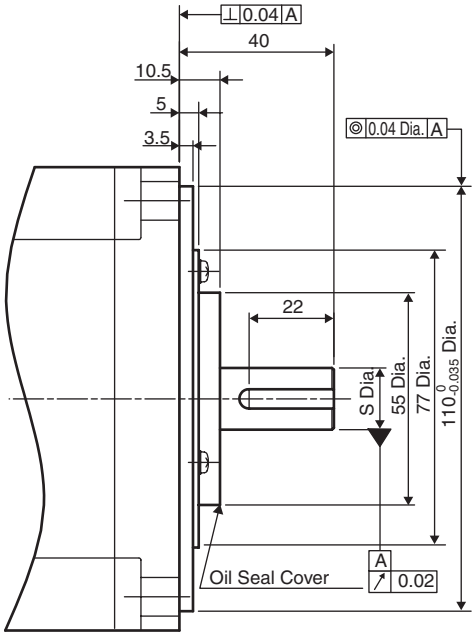
Model SGMPS-	L	LL	LP	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
08A□A2□	160	120	66.7	$16^{0}_{-0.011}$	No tap	No key				5.7
08A□A4□						22	3	5	5	
08A□A6□					M5×8L					
15A□A2□	187.5	147.5	94.7	$19^{0}_{-0.013}$	No tap	No key				8.1
15A□A4□						22	3.5	6	6	
15A□A6□					M6×10L					

Note: Refer to page 71 for dimensions of the output shaft for servomotors with oil seals.

External Dimensions Units: mm

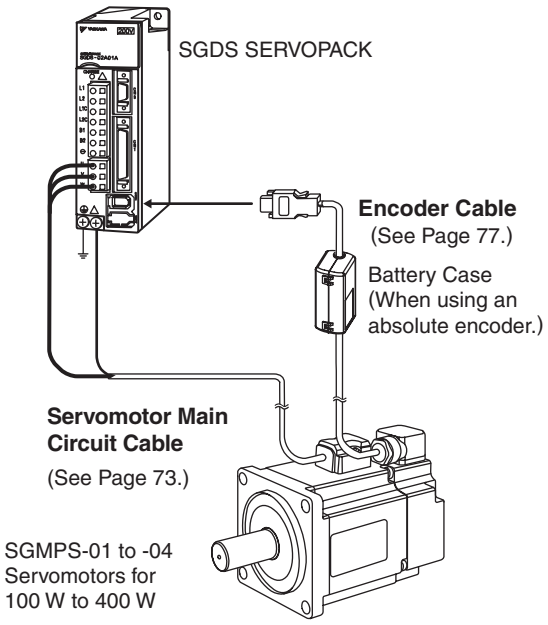
● Output Shaft of Servomotor with Oil Seal

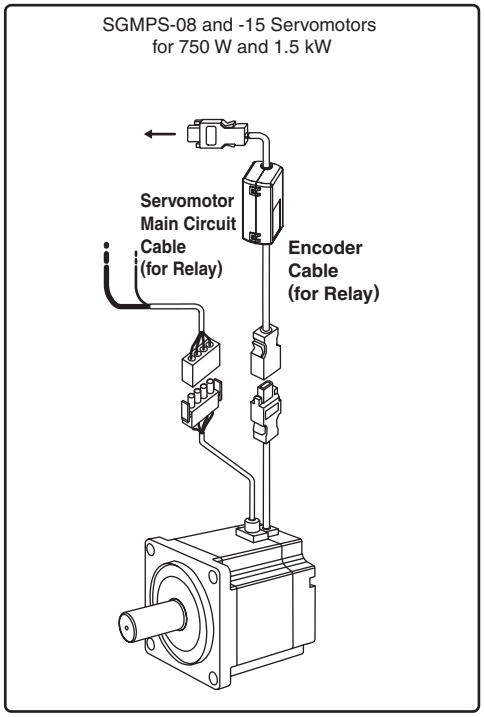
The following table shows the external dimensions of the output shafts for SGMPS servomotors with oil seals.

Model		SGMPS-01	SGMPS-02, 04	SGMPS-08	SGMPS-15
Outer Dimensions		□60	□80	□120	□120
Capacity		100 W	200 W, 400 W	750 W	1.5 kW
Output Shaft	S	$8^{0}_{-0.009}$	$14^{0}_{-0.011}$	$16^{0}_{-0.011}$	$19^{0}_{-0.013}$
	E1	22	35	—	—
	E2	39	49	—	—
	LB	$50^{0}_{-0.025}$	$70^{0}_{-0.03}$	—	—
	QK	14	16	—	—
	LE	3	3	—	—
	LS1	3.5	6.5	—	—
	LS2	7	10	—	—
	LR	25	30	—	—
Dimensional Drawings					

• Cable Connections

• For Standard Wiring

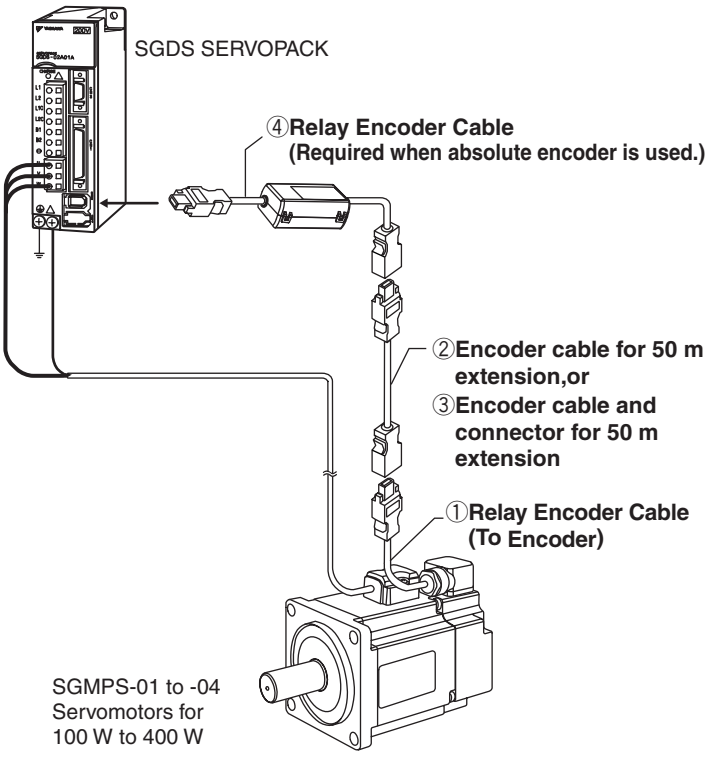


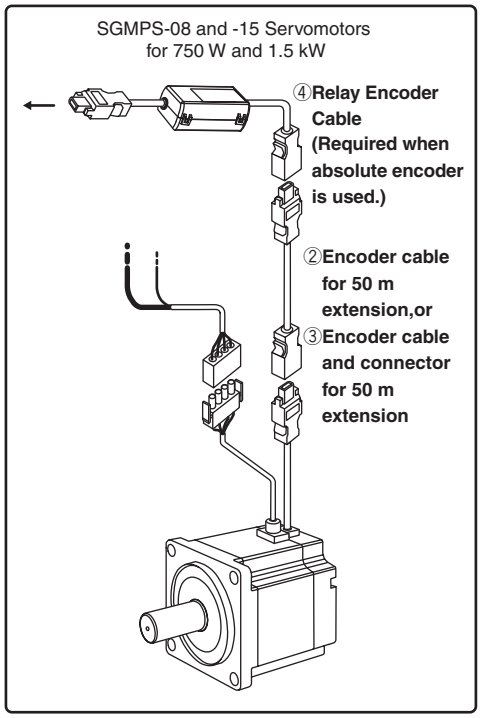


> **⚠ CAUTION**
>
> Separate the servomotor main circuit wiring from the I/O signal cable and encoder cable at least 30 cm, and do not bundle or run them in the same duct.

• For Encoder Cable Extensions from 30 m up to 50 m (see Page 80.)

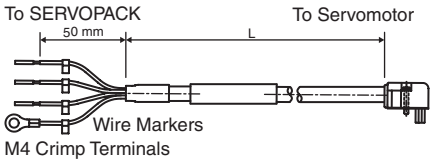
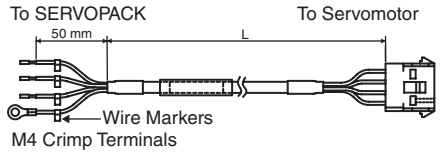
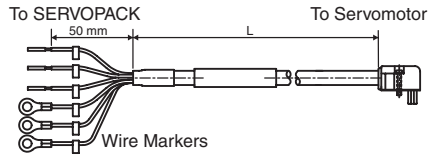
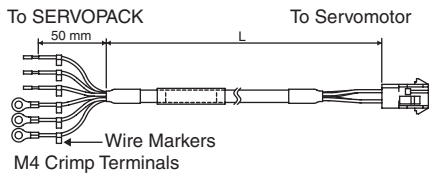
(Example)





Selecting Cables

● Servomotor Main Circuit Cables

Name	Servomotor Capacity	Length	Order No.		Specifications	Details
			Standard Cable	Flexible Cable*		
For Servomotors without Brakes	100 W	3 m	JZSP-CSM01-03-E	JZSP-CSM21-03-E		(1)
		5 m	JZSP-CSM01-05-E	JZSP-CSM21-05-E		
		10 m	JZSP-CSM01-10-E	JZSP-CSM21-10-E		
		15 m	JZSP-CSM01-15-E	JZSP-CSM21-05-E		
		20 m	JZSP-CSM01-20-E	JZSP-CSM21-20-E		
	200 W, 400 W	3 m	JZSP-CSM02-03-E	JZSP-CSM22-03-E		
		5 m	JZSP-CSM02-05-E	JZSP-CSM22-05-E		
		10 m	JZSP-CSM02-10-E	JZSP-CSM22-10-E		
		15 m	JZSP-CSM02-15-E	JZSP-CSM22-15-E		
		20 m	JZSP-CSM02-20-E	JZSP-CSM22-20-E		
	750 W	3 m	JZSP-CMM00-03-E	JZSP-CMM01-03-E		(2)
		5 m	JZSP-CMM00-05-E	JZSP-CMM01-05-E		
		10 m	JZSP-CMM00-10-E	JZSP-CMM01-10-E		
		15 m	JZSP-CMM00-15-E	JZSP-CMM01-15-E		
		20 m	JZSP-CMM00-20-E	JZSP-CMM01-20-E		
	1.5 kW	3 m	JZSP-CMM20-03-E	—		
		5 m	JZSP-CMM20-05-E	—		
		10 m	JZSP-CMM20-10-E	—		
		15 m	JZSP-CMM20-15-E	—		
		20 m	JZSP-CMM20-20-E	—		
For Servomotors with Brakes	100 W	3 m	JZSP-CSM11-03-E	JZSP-CSM31-03-E		(3)
		5 m	JZSP-CSM11-05-E	JZSP-CSM31-05-E		
		10 m	JZSP-CSM11-10-E	JZSP-CSM31-10-E		
		15 m	JZSP-CSM11-15-E	JZSP-CSM31-15-E		
		20 m	JZSP-CSM11-20-E	JZSP-CSM31-20-E		
	200 W, 400 W	3 m	JZSP-CSM12-03-E	JZSP-CSM32-03-E		
		5 m	JZSP-CSM12-05-E	JZSP-CSM32-05-E		
		10 m	JZSP-CSM12-10-E	JZSP-CSM32-10-E		
		15 m	JZSP-CSM12-15-E	JZSP-CSM32-15-E		
		20 m	JZSP-CSM12-20-E	JZSP-CSM32-20-E		
	750 W	3 m	JZSP-CMM10-03-E	JZSP-CMM11-03-E		(4)
		5 m	JZSP-CMM10-05-E	JZSP-CMM11-05-E		
		10 m	JZSP-CMM10-10-E	JZSP-CMM11-10-E		
		15 m	JZSP-CMM10-15-E	JZSP-CMM11-15-E		
		20 m	JZSP-CMM10-20-E	JZSP-CMM11-20-E		
	1.5 kW	3 m	JZSP-CMM30-03-E	—		
		5 m	JZSP-CMM30-05-E	—		
		10 m	JZSP-CMM30-10-E	—		
		15 m	JZSP-CMM30-15-E	—		
		20 m	JZSP-CMM30-20-E	—		

*: Use flexible cables for movable sections such as robot arms.

(cont'd)

Selecting Cables

● Servomotor Main Circuit Cables

Name	Servomotor Capacity	Length	Order No. Standard Cable	Order No. Flexible Cable*1	Specifications	Details
Connector Kit to Servomotor	100 W		JZSP-CSM9-1-E		Caulking*2 	(5)
	200 W, 400 W		JZSP-CSM9-2-E			(6)
	750 W, 1.5 kW (Servomotor without Brakes)		JZSP-CMM9-3-E		Caulking*2 	(7)
	750 W, 1.5 kW (Servomotor with Brakes)		JZSP-CSM9-5-E		Caulking*2 	
Cables	100 W to 400 W	5 m	JZSP-CSM90-05-E	JZSP-CSM80-05-E	20 m Max. 	(8)
		10 m	JZSP-CSM90-10-E	JZSP-CSM80-10-E		
		15 m	JZSP-CSM90-15-E	JZSP-CSM80-15-E		
		20 m	JZSP-CSM90-20-E	JZSP-CSM80-20-E		
	750 W 1.5 kW	5 m	JZSP-CSM91-05-E	JZSP-CSM81-05-E		(9)
		10 m	JZSP-CSM91-10-E	JZSP-CSM81-10-E		
		15 m	JZSP-CSM91-15-E	JZSP-CSM81-15-E		
		20 m	JZSP-CSM91-20-E	JZSP-CSM81-20-E		

*1: Use flexible cables for movable sections such as robot arms.
*2: Requires a caulking tool.

(1) Wiring for Servomotors without Brakes: 100 W to 400 W

Leads to SERVOPACK

Wire Color	Signal
Green/yellow	FG
Blue	Phase W
White	Phase V
Red	Phase U

Connector to Servomotor

Signal	Pin No.
FG	1
Phase W	2
Phase V	3
Phase U	4
—	5
—	6

(2) Wiring for Servomotors without Brakes: 750 W and 1.5 kW

Leads to SERVOPACK

Lead Color	Signal
Red	Phase U
White	Phase V
Blue	Phase W
Green/yellow	FG

Connector to Servomotor

Signal	Pin No.
Phase U	1
Phase V	2
Phase W	3
FG	4

(3) Wiring for Servomotor with Brakes: 100 W to 400 W

Leads to SERVOPACK

Lead Color	Signal
Green/yellow	FG
Blue	Phase W
White	Phase V
Red	Phase U
Black	Brake
Black	Brake

Connector to Servomotor

Signal	Pin No.
FG	1
Phase W	2
Phase V	3
Phase U	4
Brake	5
Brake	6

Note: No polarity for connection to the brake.

(4) Wiring for Servomotor with Brakes: 750 W and 1.5 kW

Leads to SERVOPACK

Lead Color	Signal
Red	Phase U
White	Phase V
Blue	Phase W
Green/yellow	FG
Black	Brake
Black	Brake

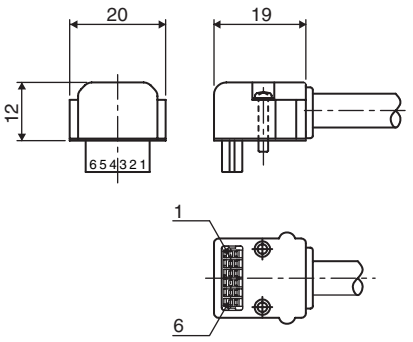
Connector to Servomotor

Signal	Pin No.
Phase U	1
Phase V	2
Phase W	3
FG	4
Brake	5
Brake	6

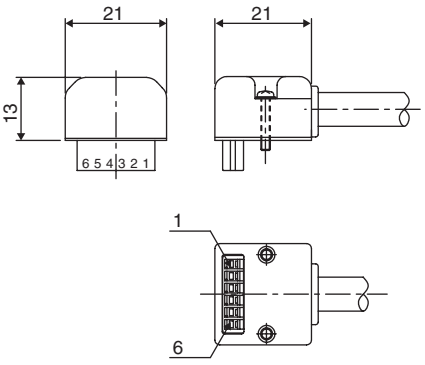
Note: No polarity for connection to the brake.

Selecting Cables

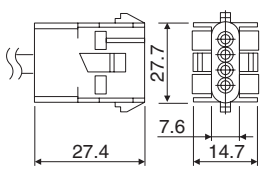
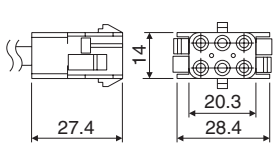
(5) Connector Kits to Servomotor:
For 100 W Servomotors

Items		Specifications
Order No.		JZSP-CSM9-1-E
Applicable Servomotors		SGMPS-01
Manufacturer		J.S.T. Mfg. Co., Ltd.
Receptacle		J17-06FMH-7KL-1-CF
Electrical Contacts		SJ1F-01GF-P0.8
Applicable Wire Size		AWG20 to 24
Outer Diameter of Insulating Sheath		1.11 to 1.53 mm
Caulking Tool	Hand Tool	YRS-8841
	Applicator	APLMK SJ1F/M-01-08
Mounting Screws		M2 Pan-head screws
Outer Diameter of Applicable Cable		7±0.3 mm
Dimensional Drawings (Units: mm)		

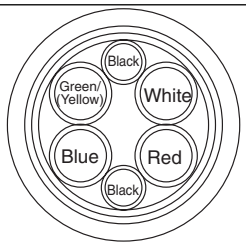
(6) Connector Kits to Servomotor:
For 200 W and 400 W Servomotors

Items		Specifications
Order No.		JZSP-CSM9-2-E
Applicable Servomotors		SGMPS-02 to -04
Manufacturer		J.S.T. Mfg. Co., Ltd.
Receptacle		J27-06FMH-7KL-1-CF
Electrical Contacts		SJ2F-01GF-P1.0
Applicable Wire Size		AWG20 to 24
Outer Diameter of Insulating Sheath		1.11 to 1.53 mm
Caulking Tool	Hand Tool	YRS-8861
	Applicator	APLMK SJ2F/M-01-08
Mounting Screws		M2 Pan-head screws
Outer Diameter of Applicable Cable		7±0.3 mm
Dimensional Drawings (Units: mm)		

(7) Connector Kits to Servomotor: For 750 W, 1.5 kW Servomotors

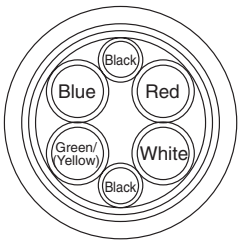
Items		Specifications		
		For Servomotors without Brakes	For Servomotors with Brakes	
Order No.		JZSP-CMM9-3-E	JZSP-CSM9-5-E	
Applicable Servomotors		SGMPS-08, -15		
Manufacturer		Tyco Electronics AMP K.K.		
Cap		350780-1	350781-1	
Socket		350536-6 or 350550-6	350536-6 or 350550-6 350570-3 or 350689-3 (For brake terminals)	
Applicable Wire Size		AWG20 to 14	AWG20 to 14 (For power line)	AWG24 to 18 (For brake line)
Caulking Tool	Hand Tool	90296-2	90296-2	90300-2
	Applicator	637763-1, 687763-2	637763-1, 687763-2	466320-1, 466320-2
Dimensional Drawings (Units: mm)				

(8) Cables: For 100 to 400 W Servomotors

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CSM90-□□-E (20 m max.)	JZSP-CSM80-□□-E (20 m max.)
Specifications	UL2517 (Max. operating temperature: 105℃) AWG20×6C For power line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.53 mm For brake line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.53 mm	UL2517 (Max. operating temperature: 105℃) AWG22×6C For power line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm For brake line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm
Finished Dimensions	7±0.3 dia. mm	
Internal Configuration and Lead Color		
Yaskawa Standard Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□ of order No.
Example: JZSP-CSM91-15-E (15 m)

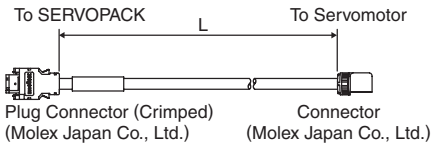
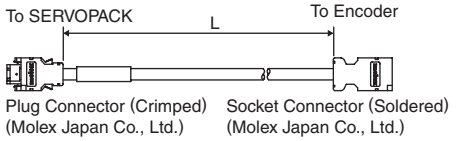
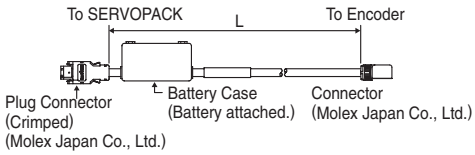
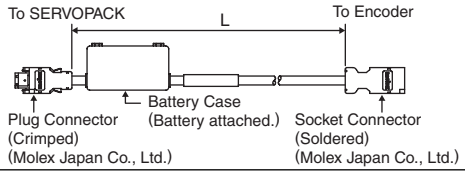
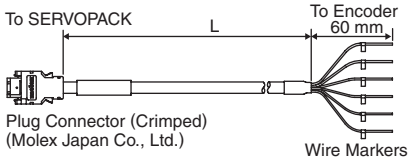
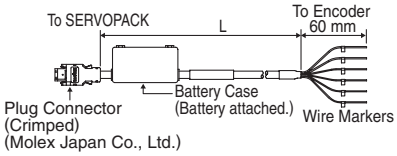
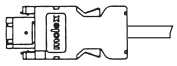
(9) Cables: For 750 W to 1.5 kW Servomotors

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CSM91-□□-E (20 m max.)	JZSP-CSM81-□□-E (20 m max.)
Specifications	UL2517 (Max. operating temperature: 105℃) AWG16×4C, AWG20×2C For power line: AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.15 mm For brake line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.6 mm	UL2517 (Max. operating temperature: 105℃) AWG16×4C, AWG22×2C For power line: AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.35 mm For brake line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm
Finished Dimensions	8.0±0.3 dia. mm	
Internal Configuration and Lead Color		
Yaskawa Standard Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□ of order No.
Example: JZSP-CSM91-15-E (15 m)

Selecting Cables

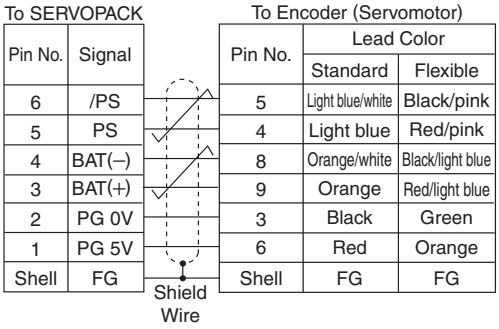
● Encoder Cables and Connectors (For Standard Wiring)

Name	Servomotor Capacity	Length	Order No. Standard Cable	Order No. Flexible Cable*	Specifications	Details
Encoder Cable with Connectors (For Incremental Encoder)	100 W to 400 W	3 m	JZSP-CSP01-03-E	JZSP-CSP21-03-E		(1)
		5 m	JZSP-CSP01-05-E	JZSP-CSP21-05-E		
		10 m	JZSP-CSP01-10-E	JZSP-CSP21-10-E		
		15 m	JZSP-CSP01-15-E	JZSP-CSP21-15-E		
		20 m	JZSP-CSP01-20-E	JZSP-CSP21-20-E		
	750 W, 1.5 kW	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E		(2)
		5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E		
		10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E		
		15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E		
		20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E		
(Note) Encoder Cable with Connectors (For Absolute Encoder, with a Battery Case)	100 W to 400 W	3 m	JZSP-CSP05-03-E	JZSP-CSP25-03-E		(3)
		5 m	JZSP-CSP05-05-E	JZSP-CSP25-05-E		
		10 m	JZSP-CSP05-10-E	JZSP-CSP25-10-E		
		15 m	JZSP-CSP05-15-E	JZSP-CSP25-15-E		
		20 m	JZSP-CSP05-20-E	JZSP-CSP25-20-E		
	750 W, 1.5 kW	3 m	JZSP-CSP19-03-E	JZSP-CSP29-03-E		(4)
		5 m	JZSP-CSP19-05-E	JZSP-CSP29-05-E		
		10 m	JZSP-CSP19-10-E	JZSP-CSP29-10-E		
		15 m	JZSP-CSP19-15-E	JZSP-CSP29-15-E		
		20 m	JZSP-CSP19-20-E	JZSP-CSP29-20-E		
Encoder Cable with Loose Wires to Encoder (For Incremental Encoder)	100 W to 1.5 kW	3 m	JZSP-CMP03-03-E	JZSP-CMP13-03-E		(5)
		5 m	JZSP-CMP03-05-E	JZSP-CMP13-05-E		
		10 m	JZSP-CMP03-10-E	JZSP-CMP13-10-E		
		15 m	JZSP-CMP03-15-E	JZSP-CMP13-15-E		
		20 m	JZSP-CMP03-20-E	JZSP-CMP13-20-E		
(Note) Encoder Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)	100 W to 1.5 kW	3 m	JZSP-CSP04-03-E	JZSP-CSP24-03-E		(6)
		5 m	JZSP-CSP04-05-E	JZSP-CSP24-05-E		
		10 m	JZSP-CSP04-10-E	JZSP-CSP24-10-E		
		15 m	JZSP-CSP04-15-E	JZSP-CSP24-15-E		
		20 m	JZSP-CSP04-20-E	JZSP-CSP24-20-E		
Connector Kit to SERVOPACK	100 W to 1.5 kW		JZSP-CMP9-1-E		Soldered 	(7)
Connector Kit to Encoder	100 W to 400 W		JZSP-CSP9-2-E		Caulking (Requires a caulking tool.) 	(8)
	750 W, 1.5 kW		JZSP-CMP9-2-E		Soldered 	(9)
Cables		5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	20 m Max. 	(10)
		10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E		
		15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E		
		20 m	JZSP-CMP09-20-E	JZSP-CSP39-20-E		

*: Use flexible cables for movable sections such as robot arms.
Note: When a battery from the host controller is used for the absolute encoder, no battery case is required. In this case, use a cable designed for incremental encoders.

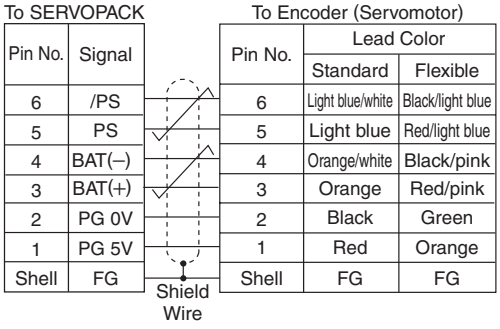
Selecting Cables

(1) Wiring for Cable with Connectors: 100 W to 400 W (For Incremental Encoder)



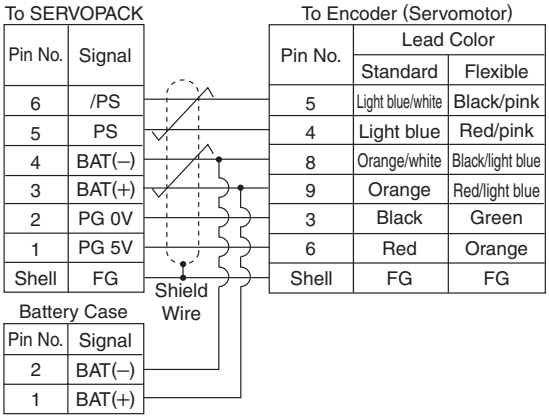
To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Pin No.	Lead Color	
			Standard	Flexible
6	/PS	5	Light blue/white	Black/pink
5	PS	4	Light blue	Red/pink
4	BAT(–)	8	Orange/white	Black/light blue
3	BAT(+)	9	Orange	Red/light blue
2	PG 0V	3	Black	Green
1	PG 5V	6	Red	Orange
Shell	FG	Shell	FG	FG

(2) Wiring for Cable with Connectors: 750 W and 1.5 kW (For Incremental Encoder)



To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Pin No.	Lead Color	
			Standard	Flexible
6	/PS	6	Light blue/white	Black/light blue
5	PS	5	Light blue	Red/light blue
4	BAT(–)	4	Orange/white	Black/pink
3	BAT(+)	3	Orange	Red/pink
2	PG 0V	2	Black	Green
1	PG 5V	1	Red	Orange
Shell	FG	Shell	FG	FG

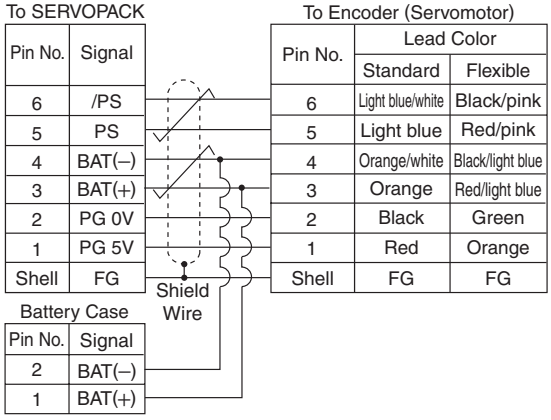
(3) Wiring for Cable with Connectors: 100 W to 400 W (For Absolute Encoder, with a Battery Case)



To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Pin No.	Lead Color	
			Standard	Flexible
6	/PS	5	Light blue/white	Black/pink
5	PS	4	Light blue	Red/pink
4	BAT(–)	8	Orange/white	Black/light blue
3	BAT(+)	9	Orange	Red/light blue
2	PG 0V	3	Black	Green
1	PG 5V	6	Red	Orange
Shell	FG	Shell	FG	FG

Battery Case	
Pin No.	Signal
2	BAT(–)
1	BAT(+)

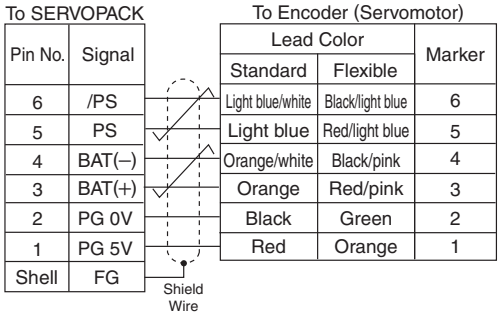
(4) Wiring for Cable with Connectors: 750 W and 1.5 kW (For Absolute Encoder, with a Battery Case)



To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Pin No.	Lead Color	
			Standard	Flexible
6	/PS	6	Light blue/white	Black/pink
5	PS	5	Light blue	Red/pink
4	BAT(–)	4	Orange/white	Black/light blue
3	BAT(+)	3	Orange	Red/light blue
2	PG 0V	2	Black	Green
1	PG 5V	1	Red	Orange
Shell	FG	Shell	FG	FG

Battery Case	
Pin No.	Signal
2	BAT(–)
1	BAT(+)

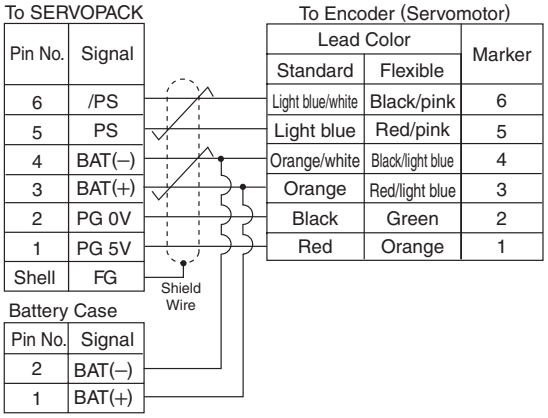
(5) Wiring for Cable with Loose Wires to Encoder (For Incremental Encoder)



To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Lead Color		Marker
		Standard	Flexible	
6	/PS	Light blue/white	Black/light blue	6
5	PS	Light blue	Red/light blue	5
4	BAT(–)	Orange/white	Black/pink	4
3	BAT(+)	Orange	Red/pink	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

Notes: 1 The signals BAT (+) and BAT (-) are used when using an absolute encoder.
2 Be sure to connect the shield wire of encoder cable to the connector case (shell).

(6) Wiring for Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)

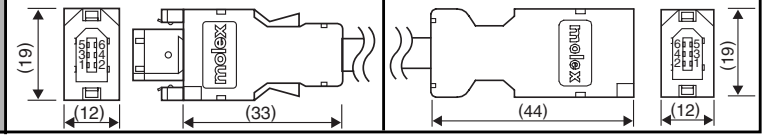


To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Lead Color		Marker
		Standard	Flexible	
6	/PS	Light blue/white	Black/pink	6
5	PS	Light blue	Red/pink	5
4	BAT(–)	Orange/white	Black/light blue	4
3	BAT(+)	Orange	Red/light blue	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

Battery Case	
Pin No.	Signal
2	BAT(–)
1	BAT(+)

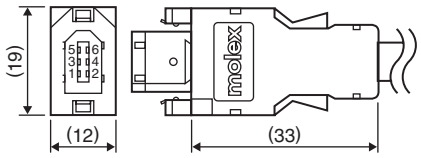
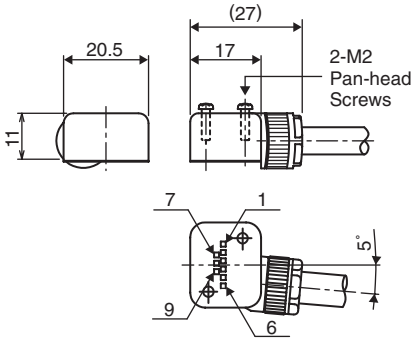
Note: Be sure to connect the shield wire of encoder cable to the connector case (shell).

(7) Connector Kits to SERVOPACK

Items	To SERVOPACK	To Servomotor (Encoder)
Order No.	JZSP-CMP9-1-E	JZSP-CMP9-2-E
Manufacturer	Molex Japan Co., Ltd.	Molex Japan Co., Ltd.
Specifications	55100-0670 (soldered)	54280-0609 (soldered)
Dimensional Drawings (Units: mm)		

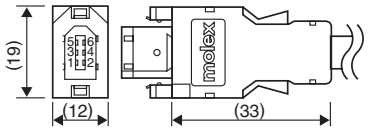
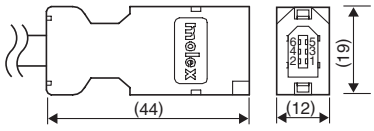
Selecting Cables

(8) Connector Kits to Encoder: 100 W to 400 W

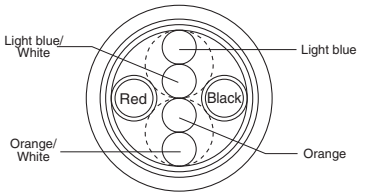
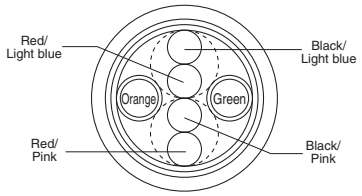
Items	To SERVOPACK	To Servomotor (Encoder)
Order No.	JZSP-CMP9-1-E	JZSP-CSP9-2-E
Manufacturer	Molex Japan Co., Ltd.	Molex Japan Co., Ltd.
Specifications	55100-0670 (soldered) Application Specifications: AS-54280 Crimping Specifications: CS-50639	54346-0070 (caulking)* Mounting screw: M2 pan-head screw (×2) Outer diameter of applicable cable: 6.3 to 7.7 mm Applicabel wire size: AWG22 to 26 Outer diameter of insulating sheath: 1.05 to 1.4 mm Application Specifications: AS-54992 Crimping Specifications: CS-56161
Dimensional Drawings (Units: mm)		

*: A caulking tool is required.
The following caulking tools are applicable for the cables provided by Yaskawa. When using other wire sizes, contact the respective manufacturer for caulking tools.
Applicable caulking tool for Yaskawa's wire size: Hand Tool Model No. 57175-5000
Applicator Model No. 57175-3000

(9) Connector Kits to Encoder: 750 W and 1.5 kW

Items	To SERVOPACK	To Servomotor (Encoder)
Order No.	JZSP-CMP9-1-E	JZSP-CMP9-2-E
Manufacturer	Molex Japan Co., Ltd.	Molex Japan Co., Ltd.
Specifications	55100-0670 (soldered)	54280-0609 (soldered)
Dimensional Drawings (Units: mm)		

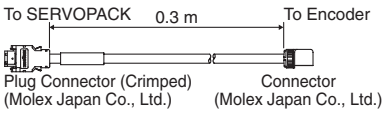
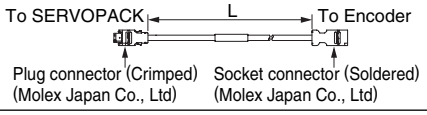
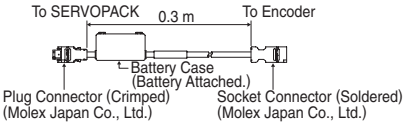
(10) Cables

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CMP09-□□-E	JZSP-CSP39-□□-E
Cable Length	20 m max.	
Specifications	UL20276 (Max. operating temperature: 80℃) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.15 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.09 mm	UL20276 (Max. operating temperature: 80℃) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath:1.35 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.21 mm
Finished Dimensions	6.5 dia. mm	6.8 dia. mm
Internal Configuration and Lead Color		
Yaskawa Standards Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP09-05-E (5 m)

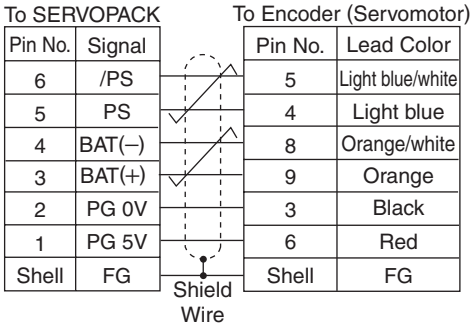
Selecting Cables

● Encoder Cables and Connectors (For Extending from 30 m up to 50 m)

Name		Length	Order No. Standard Cable	Specifications	Details
① Relay Encoder Cables(for Relay)	For Encoder (Same for Incremental and Absolute Encoders) Only for 100 to 400 W	0.3 m	JZSP-CSP11-E		(1)
② Encoder cable for 50 m extension*	(Same for Incremental and Absolute Encoders)	30 m	JZSP-UCMP00-30-E		(2)
		40 m	JZSP-UCMP00-40-E		
		50 m	JZSP-UCMP00-50-E		
③ Encoder cable and connector for 50 m extension	30 m to 50 m encoder cables are available.	30 m	JZSP-CMP19-30-E	50 m Max. 	(3)
		40 m	JZSP-CMP19-40-E		
		50 m	JZSP-CMP19-50-E		
④ Relay Encoder Cables(for Relay)	For SERVOPACK (For Absolute Encoder, with a Battery Case)	0.3 m	JZSP-CSP12-E*		(4)

*: Not required if using an incremental encoder or if using an absolute encoder with a battery connected to the host controller.

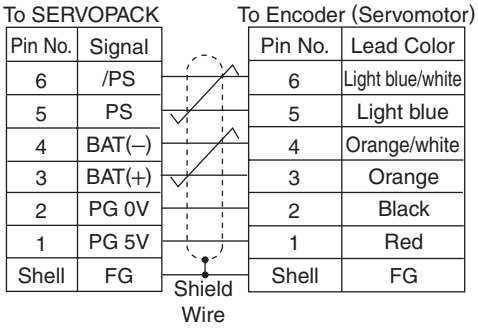
(1) Wiring for Relay Encoder Cable to Encoder (For Incremental and Absolute Encoders)



Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

Pin No.	Lead Color
5	Light blue/white
4	Light blue
8	Orange/white
9	Orange
3	Black
6	Red
Shell	FG

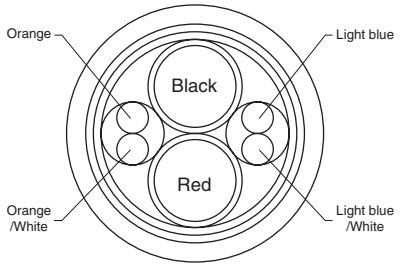
(2) Wiring specification of 50 m encoder cable extension



Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

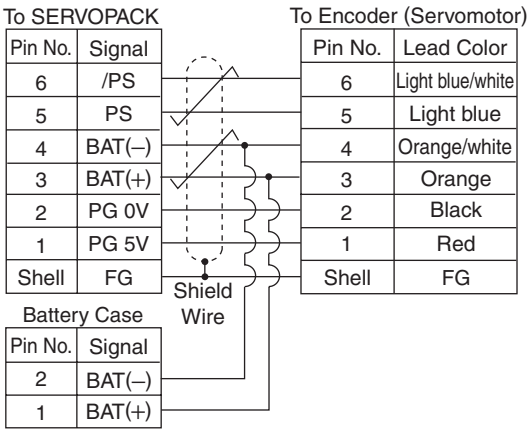
Pin No.	Lead Color
6	Light blue/white
5	Light blue
4	Orange/white
3	Orange
2	Black
1	Red
Shell	FG

(3) Specification of 50 m encoder cable extension

Application	Standard Cable
Order No.*	JZSP-CMP19-□□-E
Cable Length	50 m max.
Specifications	UL20276 (Max. operating temperature: 80°C) AWG16×2C+AWG26×2P AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.0 mm AWG26 (0.13 mm²) Outer diameter of insulating sheath: 0.91 mm
Finished Dimensions	6.8 dia. mm
Internal Configuration and Lead Colors	
Yaskawa Standard Specifications (Standard Length)	Cable length: 30 m, 40 m, 50 m

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP19-30 -E(30 m)

(4) Wiring for Relay Encoder Cable to SERVOPACK (For Absolute Encoder, with a Battery Case)



Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG 0V
1	PG 5V
Shell	FG

Pin No.	Lead Color
6	Light blue/white
5	Light blue
4	Orange/white
3	Orange
2	Black
1	Red
Shell	FG

Pin No.	Signal
2	BAT(–)
1	BAT(+)

With Standard Backlash Gears | Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Gear Mechanism: Planetary gear mechanism
Thermal Class: B

Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 15 minutes max.

Servomotor Model SGMPS-	Servomotors			Gears						Moment of Inertia ×10⁻⁴ kg·m²	
	Output W	Rated Speed min⁻¹	Rated Torque N·m	Gear Ratio	Lost Motion arc-min	Rated Torque/ Efficiency ※2 N·m/%	Instantaneous Peak Torque N·m	Rated Speed min⁻¹	Max. Speed※1 min⁻¹	Motor + Gears	Gears
01A□AJ1□	100	3000	0.318	1/5	15	1.27/80	4.32	600	800	0.122	0.063
01A□AJ3□				3/31		2.63/80	8.88	290	387	0.077	0.018
01A□AJC□				1/21		5.34/80	18.1	143	190	0.094	0.035
01A□AJ7□				1/33		8.40/80	28.4	91	121	0.080	0.021
02A□AJ1□	200	3000	0.637	1/5	15	2.55/80	8.60	600	800	0.456	0.193
02A□AJ3□				3/31		5.27/80	17.8	290	387	0.353	0.090
02A□AJC□				1/21		10.7/80	36.1	143	190	0.368	0.105
02A□AJ7□				1/33		16.8/80	56.7	91	121	0.338	0.075
04A□AJ1□	400	3000	1.27	1/5	15	5.08/80	17.2	600	800	0.602	0.193
04A□AJ3□				3/31		10.5/80	35.5	290	387	0.589	0.180
04A□AJC□				1/21		21.3/80	72.2	143	190	0.639	0.230
04A□AJ7□				1/33		33.5/80	113	91	121	0.574	0.165
08A□AJ1□	750	3000	2.39	1/5	15	9.56/80	32.0	600	800	2.55	0.450
08A□AJ3□				3/31		19.8/80	66.6	290	387	2.53	0.425
08A□AJC□				1/21		40.2/80	134	143	190	2.58	0.475
08A□AJ7□				1/33		63.1/80	213	91	121	2.40	0.300
15A□AJ1□	1500	3000	4.77	1/5	15	19.1/80	64.4	600	800	4.97	0.950
15A□AJB□				1/11		42.0/80	144	269	359	5.27	1.250
15A□AJC□				1/21		80.1/80	270	143	190	5.33	1.300
15A□AJ7□				1/33		126/80	425	91	121	4.82	0.800

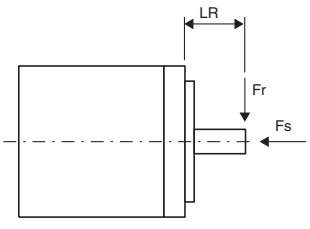
※1: Maximum motor speed is up to 4000 min⁻¹ at the shaft.
※2: Gear output torque is expressed using the following equation.

$$\text{(Gear output torque)} = \text{(servomotor output torque)} \times \frac{1}{\text{(gear ratio)}} \times \text{(efficiency)}$$

Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

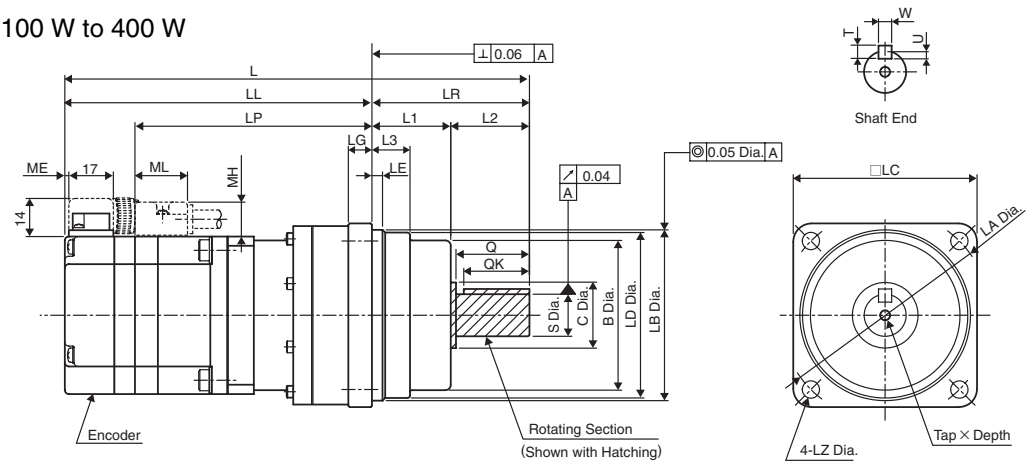
• Allowable Radial and Thrust Loads

Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model SGMPS-	Servomotors with Standard Backlash Gears			
	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
01A□AJ1□	175	145	55	
01A□AJ3□	215			
01A□AJC□	455	235	69	
01A□AJ7□	480			
02A□AJ1□	275	235	69	
02A□AJ3□	360			
02A□AJC□	585	290	79	
02A□AJ7□	635			
04A□AJ1□	275	235	69	
04A□AJ3□	460	290	79	
04A□AJC□	655	310	100	
04A□AJ7□	755			
08A□AJ1□	355	290	79	
08A□AJ3□	525	310	100	
08A□AJC□	1070	490	102	
08A□AJ7□	1205			
15A□AJ1□	400	310	100	
15A□AJB□	860	490	102	
15A□AJC□	1690	880	112	
15A□AJ7□				

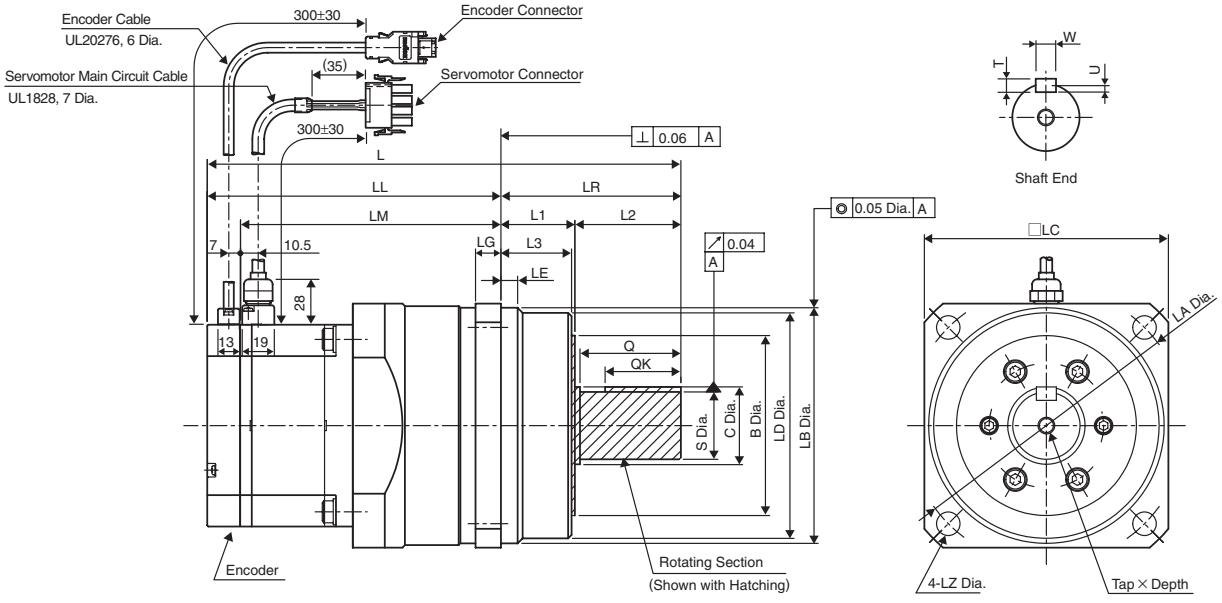
● Without Brakes

(1) 100 W to 400 W



Model SGMPS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	C	LD	LB	LC	LA	LZ	L1	L2	L3	Q	S	Tap × Depth	QK	U	W	T	ME	MH	ML	Approx. Mass kg
01A□AJ1□1	1/5	177	117	91	60	4	9	57	25	63	65 $^{0}_{-0.03}$	70	80	6.6	30	30	14.5	28	16 $^{0}_{-0.018}$	M4×8L	25	3	5	5	1	12	20	1.3
01A□AJ3□1	3/31																											
01A□AJC□1	1/21	195.5	121.5	95.5	74		10	69	32	83	85 $^{0}_{-0.035}$	90	105	9	36	38	19.5	36	20 $^{0}_{-0.021}$	M5×10L	32	3.5	6	6				2.4
01A□AJ7□1	1/33																											
02A□AJ1□1	1/5	200.5	126.5	102.5	74	4	10	69	32	83	85 $^{0}_{-0.035}$	90	105	9	36	38	19.5	36	20 $^{0}_{-0.021}$	M5×10L	32	3.5	6	6	1.5	13	21	2.8
02A□AJ3□1	3/31																											
02A□AJC□1	1/21	221	137	113	84	4	12	82	40	98	100 $^{0}_{-0.035}$	105	120		40	44	23	42	25 $^{0}_{-0.021}$	M6×12L	36	4	8	7				4.2
02A□AJ7□1	1/33																											
04A□AJ1□1	1/5	210.5	136.5	112.5	74	4	10	69	32	83	85 $^{0}_{-0.035}$	90	105	9	36	38	19.5	36	20 $^{0}_{-0.021}$	M5×10L	32	3.5	6	6				3.1
04A□AJ3□1	3/31	231	147	123	84		12	82	40	98	100 $^{0}_{-0.035}$	105	120		40	44	23	42	25 $^{0}_{-0.021}$	M6×12L	36	4	8	7				4.0
04A□AJC□1	1/21	259	154	130	105	5	13	93	50	112	115 $^{0}_{-0.035}$	120	135	11	45	60	26.5	58	32 $^{0}_{-0.025}$	M8×16L	50	5	10	8				6.1
04A□AJ7□1	1/33																											

(2) 750 W and 1.5 kW

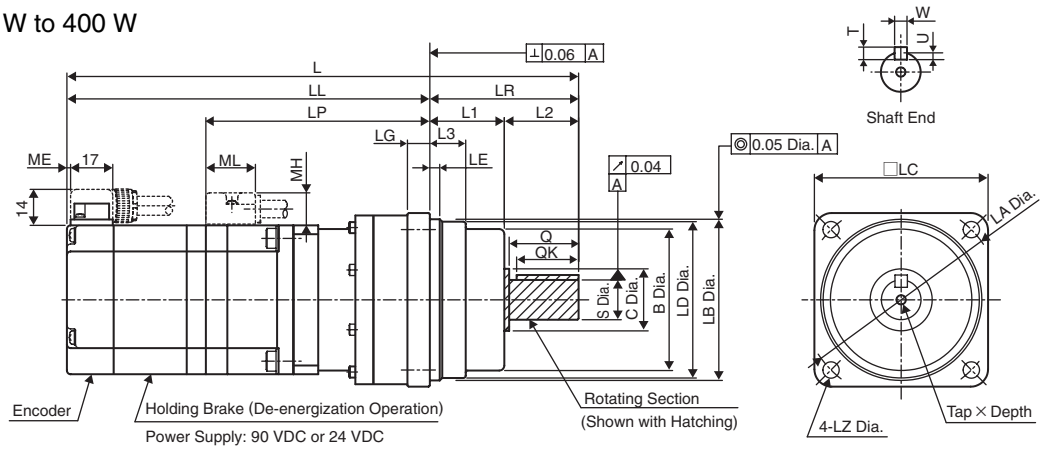


Model SGMPS-	Gear Ratio	L	LL	LM	LR	LE	LG	B	C	LD	LB	LC	LA	LZ	L1	L2	L3	Q	S	Tap × Depth	QK	U	W	T	Approx.Mass kg
08A□AJ1□1	1/5	240.5	156.5	137	84	4	12	82	40	98	100 $^{0}_{-0.035}$	105	120	9	40	44	23	42	25 $^{0}_{-0.021}$	M6×12L	36	4	8	7	6.8
08A□AJ3□1	3/31	268.5	163.5	144	105	5	13	93	50	112	115 $^{0}_{-0.035}$	120	135	11	45	60	26.5	58	32 $^{0}_{-0.025}$	M8×16L	50	5	10	8	8.3
08A□AJC□1	1/21	281.5	174.5	155	107	10	15	107	46	134	140 $^{0}_{-0.04}$	145	165	14	44	63	42	60	40 $^{0}_{-0.025}$	M10×20L	45		12		13.2
08A□AJ7□1	1/33																								
15A□AJ1□1	1/5	296.5	191.5	172	105	5	13	93	50	112	115 $^{0}_{-0.035}$	120	135	11	45	60	26.5	58	32 $^{0}_{-0.025}$	M8×16L	50	5	10	8	11.4
15A□AJB□1	1/11	309.5	202.5	183	107	10	15	107	46	134	140 $^{0}_{-0.04}$	145	165	14	44	63	42	60	40 $^{0}_{-0.025}$	M10×20L	45		12		16.6
15A□AJC□1	1/21	325.5	208.5	189	117	17	16	135	51	163	165 $^{0}_{-0.04}$	170	190		53	64	51		45 $^{0}_{-0.025}$			5.5	14	9	21.6
15A□AJ7□1	1/33																								

With Standard Backlash Gears | External Dimensions Units: mm

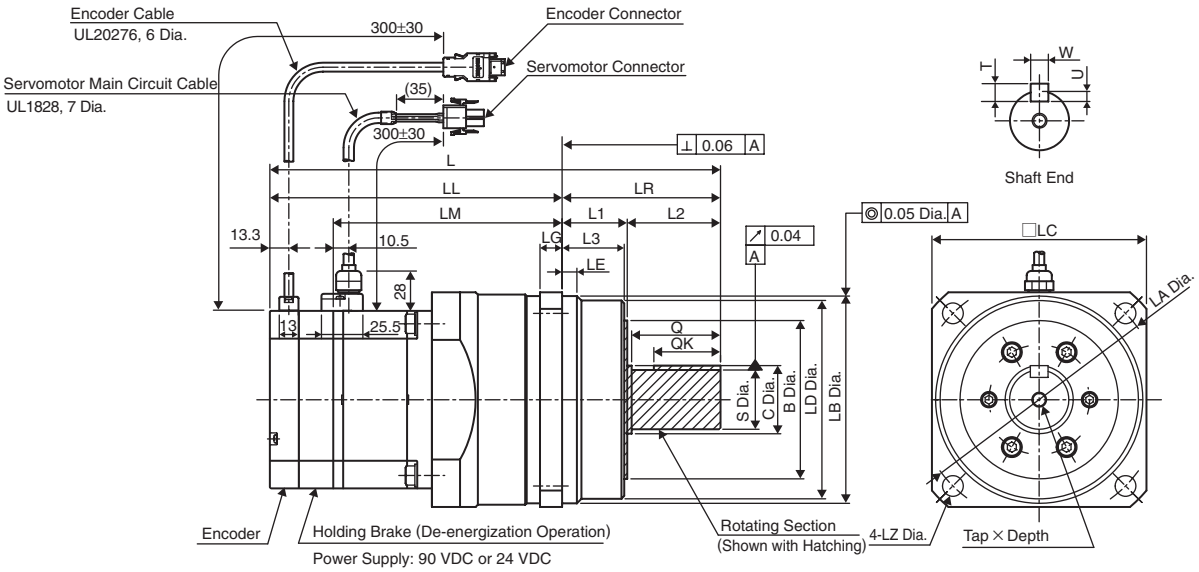
● With Brakes

(1) 100 W to 400 W



Model SGMPS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	C	LD	LB	LC	LA	LZ	L1	L2	L3	Q	S	Tap × Depth	QK	U	W	T	ME	MH	ML	Approx. Mass kg
01A□AJ1□□	1/5	205	145	91	60	4	9	57	25	63	65 $^{0}_{-0.03}$	70	80	6.6	30	30	14.5	28	16 $^{0}_{-0.018}$	M4×8L	25	3	5	5	1	12	20	1.5
01A□AJ3□□	3/31																											
01A□AJC□□	1/21	223.5	149.5	95.5	74	4	10	69	32	83	85 $^{0}_{-0.035}$	90	105	9	36	38	19.5	36	20 $^{0}_{-0.021}$	M5×10L	32	3.5	6	6				2.6
01A□AJ7□□	1/33																											
02A□AJ1□□	1/5	232	158	102.5	74	4	10	69	32	83	85 $^{0}_{-0.035}$	90	105	9	36	38	19.5	36	20 $^{0}_{-0.021}$	M5×10L	32	3.5	6	6	1.5	13	21	3.3
02A□AJ3□□	3/31																											
02A□AJC□□	1/21	252.5	168.5	113	84	4	12	82	40	98	100 $^{0}_{-0.035}$	105	120		40	44	23	42	25 $^{0}_{-0.021}$	M6×12L	36	4	8	7				4.7
02A□AJ7□□	1/33																											
04A□AJ1□□	1/5	242	168	112.5	74	4	10	69	32	83	85 $^{0}_{-0.035}$	90	105	9	36	38	19.5	36	20 $^{0}_{-0.021}$	M5×10L	32	3.5	6	6				3.6
04A□AJ3□□	3/31	262.5	178.5	123	84		12	82	40	98	100 $^{0}_{-0.035}$	105	120		40	44	23	42	25 $^{0}_{-0.021}$	M6×12L	36	4	8	7				4.5
04A□AJC□□	1/21	290.5	185.5	130	105	5	13	93	50	112	115 $^{0}_{-0.035}$	120	135	11	45	60	26.5	58	32 $^{0}_{-0.025}$	M8×16L	50	5	10	8				6.6
04A□AJ7□□	1/33																											

(2) 750 W and 1.5 kW



Model SGMPS-	Gear Ratio	L	LL	LM	LR	LE	LG	B	C	LD	LB	LC	LA	LZ	L1	L2	L3	Q	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
08A□AJ1□□	1/5	274	190	137	84	4	12	82	40	98	100 $^{0}_{-0.035}$	105	120	9	40	44	23	42	25 $^{0}_{-0.021}$	M6×12L	36	4	8	7	8.3
08A□AJ3□□	3/31	302	197	144	105	5	13	93	50	112	115 $^{0}_{-0.035}$	120	135	11	45	60	26.5	58	32 $^{0}_{-0.025}$	M8×16L	50	5	10	8	9.8
08A□AJC□□	1/21	315	208	155	107	10	15	107	46	134	140 $^{0}_{-0.04}$	145	165	14	44	63	42	60	40 $^{0}_{-0.025}$	M10×20L	45	5	12	8	14.7
08A□AJ7□□	1/33																								
15A□AJ1□□	1/5	330	225	172	105	5	13	93	50	112	115 $^{0}_{-0.035}$	120	135	11	45	60	26.5	58	32 $^{0}_{-0.025}$	M8×16L	50	5	10	8	12.9
15A□AJB□□	1/11	343	236	183	107	10	15	107	46	134	140 $^{0}_{-0.04}$	145	165	14	44	63	42	60	40 $^{0}_{-0.025}$	M10×20L	45	5.5	12	8	18.1
15A□AJC□□	1/21	359	242	189	117	17	16	135	51	163	165 $^{0}_{-0.04}$	170	190		53	64	51		45 $^{0}_{-0.025}$				14	9	23.1
15A□AJ7□□	1/33																								

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Gear Mechanism: Planetary gear mechanism
Thermal Class: B

Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 3 minutes max.

Servomotor Model SGMPS-	Servomotor			Gears						Moment of Inertia ×10^{-4} kg·m^2	
	Output W	Rated Speed min^{-1}	Rated Torque N·m	Gear Ratio	Lost Motion arc-min	Rated Torque/ Efficiency *2 N·m/%	Instantaneous Peak Torque N·m	Rated Speed min^{-1}	Max. Speed*1 min^{-1}	Motor + Gears	Gears
01A□AH1□	100	3000	0.318	1/5	3	1.27/80	4.34	600	800	0.152	0.093
01A□AHB□				1/11		2.80/80	9.55	273	363	0.107	0.048
01A□AHC□				1/21		5.34/80	18.2	143	190	0.102	0.043
01A□AH7□				1/33		8.40/80	28.7	91	121	0.092	0.033
02A□AH1□	200	3000	0.637	1/5	3	2.55/80	8.40	600	800	0.623	0.360
02A□AHB□				1/11		5.96/85	19.3	273	363	0.351	0.088
02A□AHC□				1/21		11.4/85	37.3	143	190	0.373	0.110
02A□AH7□				1/33		17.9/85	58.6	91	121	0.328	0.065
04A□AH1□	400	3000	1.27	1/5	3	5.40/85	17.6	600	800	0.769	0.360
04A□AHB□				1/11		11.9/85	39.1	273	363	0.604	0.195
04A□AHC□				1/21		22.7/85	72.2	143	190	0.604	0.195
04A□AH7□				1/33		33.5/80	115	91	121	0.582	0.173
08A□AH1□	750	3000	2.39	1/5	3	10.2/85	33.3	600	800	2.87	0.765
08A□AHB□				1/11		22.3/85	71.0	273	363	2.62	0.523
08A□AHC□				1/21		42.7/85	140	143	190	2.76	0.663
08A□AH7□				1/33		67.0/85	206	91	121	2.56	0.455
15A□AH1□	1500	3000	4.77	1/5	3	20.3/85	65.9	600	800	5.56	1.54
15A□AHB□				1/11		44.6/85	148	273	363	6.11	2.09
15A□AHC□				1/21		80.1/80	270	143	190	6.00	1.98
15A□AH7□				1/33		126/80	353*3	91	121	5.14	1.12

*1: Maximum motor speed is up to 4000 min^{-1} at the shaft.
*2: Gear output torque is expressed using the following equation.

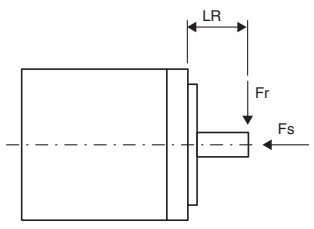
$$\text{(Gear output torque)} = \text{(servomotor output torque)} \times \frac{1}{\text{(gear ratio)}} \times \text{(efficiency)}$$

*3: The instantaneous peak torque values indicated with *3 are limited by the gear, so use the following servomotor instantaneous peak torque. In this case, set torque parameters Pn402 and 403 for the SERVOPACK at 250%.
Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later.
This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

IMPORTANT
The SERVOPACK speed control range is 5000:1. When using servomotors at extremely low speeds (0.02 min^{-1} at gear output shaft), or when using servomotors with 1 pulse feed reference for extended periods etc., the gear bearing lubrication may be insufficient. That may cause deterioration of bearing or increase the load ratio. Contact your Yaskawa representative if you are using your servomotor under these conditions.

• Allowable Radial and Thrust Loads

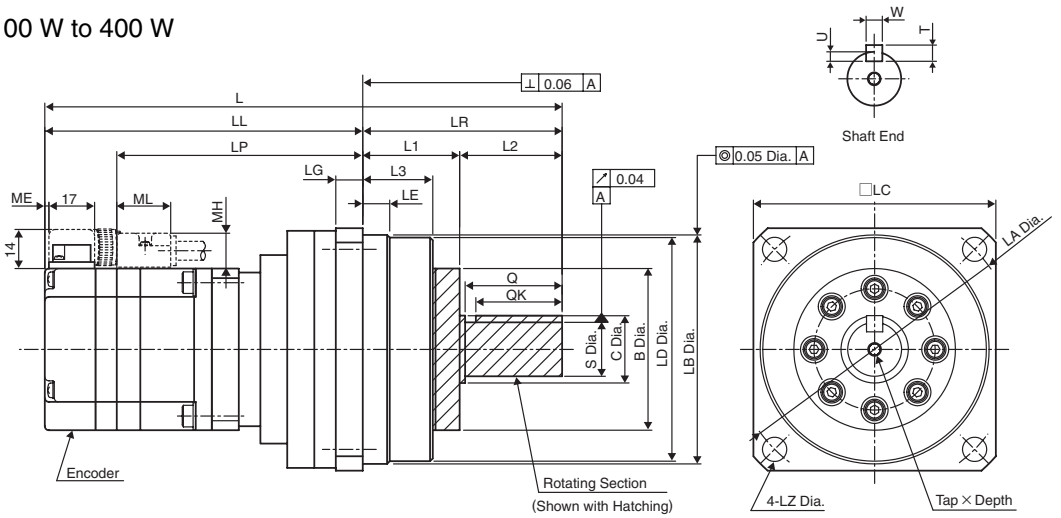
Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model SGMPS-	Servomotors with Low-backlash Gears			
	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
01A□AH1□	167	147	55	
01A□AHB□	216			
01A□AHC□	392	235	69	
01A□AH7□	431			
02A□AH1□	245	235	69	
02A□AHB□	323			
02A□AHC□	549	294	79	
02A□AH7□	608			
04A□AH1□	245	235	69	
04A□AHB□	441	294	79	
04A□AHC□	568	314	100	
04A□AH7□	657			
08A□AH1□	343	294	79	
08A□AHB□	451	314	100	
08A□AHC□	813	490	137	
08A□AH7□	921			
15A□AH1□	353	314	137	
15A□AHB□	647	490		
15A□AHC□	1274	882	151	
15A□AH7□				

With Low-backlash Gears — External Dimensions Units: mm

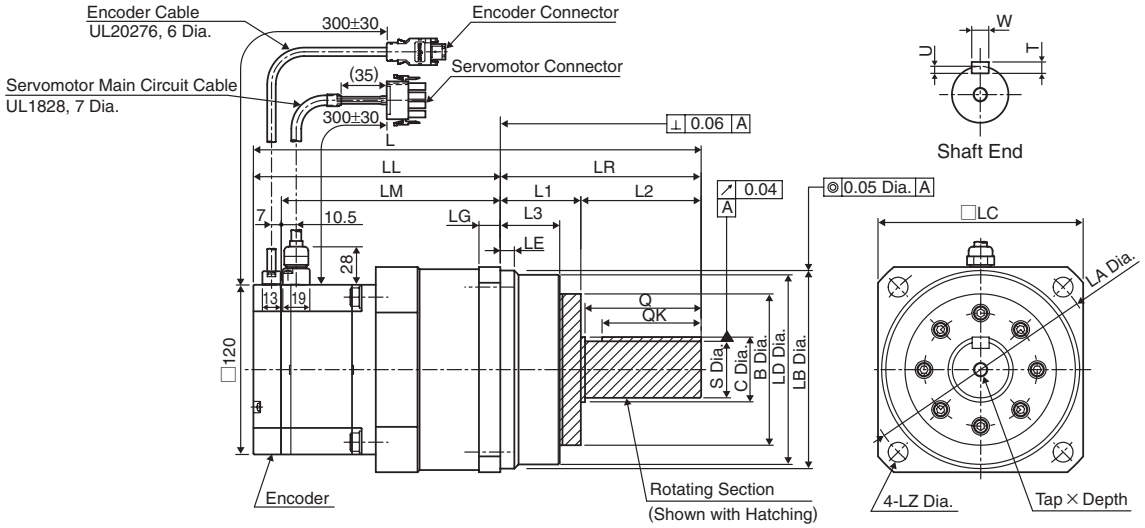
● Without Brakes

(1) 100 W to 400 W



Model SGMPS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	C	LD	LB	LC	LA	LZ	L1	L2	L3	Q	S	Tap × Depth	QK	U	W	T	ME	MH	ML	Approx. Mass kg
01A□AH1□1	1/5	168	108	82	60	8	9	40	20	64.5	65 -0.03	70	80	6.6	30	30	22	28	16 -0.018	M4×8L	25	3	5	5	1	12	20	1.3
01A□AHB□1	1/11																											
01A□AHC□1	1/21	191	117	91	74	7.5	10	59	26	84	85 -0.035	90	105	9	36	38	26	36	20 -0.021	M5×10L	32	3.5	6	6				2.8
01A□AH7□1	1/33																											
02A□AH1□1	1/5	197	123	99	74	7.5	10	59	26	84	85 -0.035	90	105	9	36	38	26	36	20 -0.021	M5×10L	32	3.5	6	6	1.5	13	21	3.2
02A□AHB□1	1/11																											3.5
02A□AHC□1	1/21	215	131	107	84	12	12	59	32	96	100 -0.035	105	120		40	44	29	42	25 -0.021	M6×12L	36	4	8	7				3.8
02A□AH7□1	1/33																											
04A□AH1□1	1/5	207	133	109	74	7.5	10		26	84	85 -0.035	90	105	9	36	38	26	36	20 -0.021	M5×10L	32	3.5	6	6				3.5
04A□AHB□1	1/11	225	141	117	84	12	12	59	32	96	100 -0.035	105	120		40	44	29	42	25 -0.021	M6×12L	36	4	8	7				4.1
04A□AHC□1	1/21	253	148	124	105	14	13		40	112	115 -0.035	120	135	11	45	60	33	58	32 -0.025	M8×16L	50	5	10	8				4.5
04A□AH7□1	1/33	254	149	125		12.5		84	40	114																		7.0

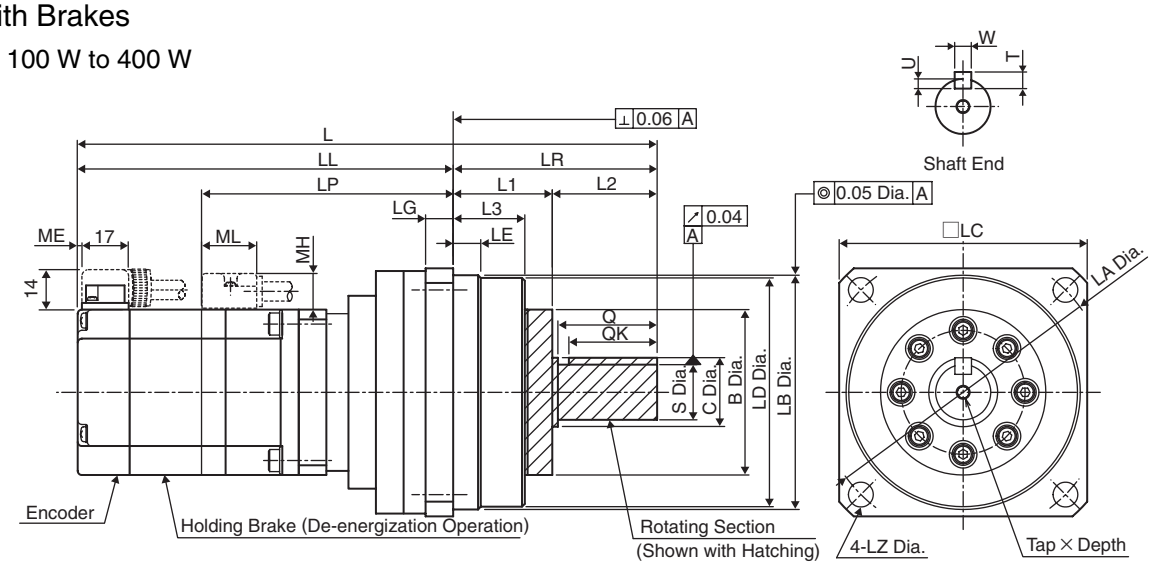
(2) 750 W and 1.5 kW



Model SGMPS-	Gear Ratio	L	LL	LM	LR	LE	LG	B	C	LD	LB	LC	LA	LZ	L1	L2	L3	Q	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
08A□AH1□1	1/5	234.5	150.5	131	84	12	12	59	32	96	100 -0.035	105	120	9	40	44	29	42	25 -0.021	M6×12L	36	4	8	7	6.9
08A□AHB□1	1/11	263.5	158.5	139	105	14	13	59	40	112	115 -0.035	120	135	11	45	60	33	58	32 -0.025	M8×16L	50	5	10	8	8.0
08A□AHC□1	1/21	316.5	174.5	155	142	10	15	84	44	134	140 -0.04	145	165	14	57	85	40	82	40 -0.025	M10×20L	70	5	12	8	11.0
08A□AH7□1	1/33																								
15A□AH1□1	1/5	291.5	186.5	167	105	12.5	13	84	40	114	115 -0.035	120	135	11	45	60	33	58	32 -0.025	M8×16L	50	5	10	8	13.1
15A□AHB□1	1/11	344.5	202.5	183	142	10	15		44	134	140 -0.04	145	165	14	57	85	40	82	40 -0.025	M10×20L	70	5.5	14	9	11.3
15A□AHC□1	1/21	364.5	208.5	189	156	16	16	135	51	163	165 -0.04	170	190		70	86	51		45 -0.025						23.6
15A□AH7□1	1/33																								

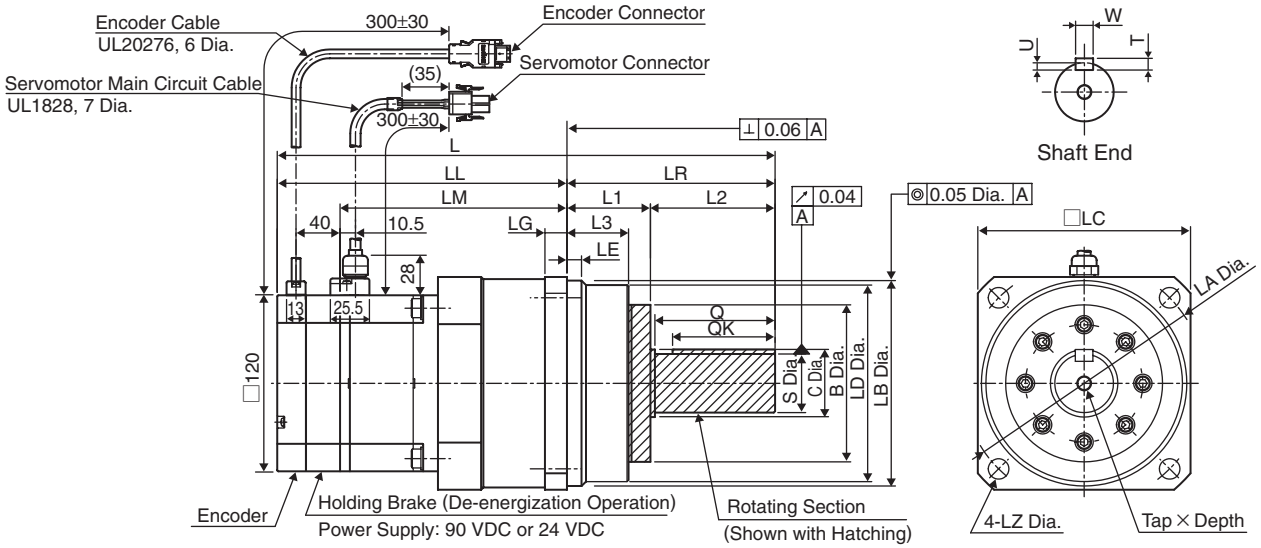
● With Brakes

(1) 100 W to 400 W



Model SGMPS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	C	LD	LB	LC	LA	LZ	L1	L2	L3	Q	S	Tap × Depth	QK	U	W	T	ME	MH	ML	Approx. Mass kg
01A□AH1□□	1/5	196	136	82	60	8	9	40	20	64.5	65 -0.03	70	80	6.6	30	30	22	28	16 -0.018	M4×8L	25	3	5	5	1	12	20	1.5
01A□AHB□□	1/11																											
01A□AHC□□	1/21	219	145	91	74	7.5	10	59	26	84	85 -0.035	90	105	9	36	38	26	36	20 -0.021	M5×10L	32	3.5	6	6				3.0
01A□AH7□□	1/33																											
02A□AH1□□	1/5	228.5	154.5	99	74	7.5	10	59	26	84	85 -0.035	90	105	9	36	38	26	36	20 -0.021	M5×10L	32	3.5	6	6	1.5	13	21	3.7
02A□AHB□□	1/11																											4.0
02A□AHC□□	1/21	246.5	162.5	107	84	12	12		32	96	100 -0.035	105	120		40	44	29	42	25 -0.021	M6×12L	36	4	8	7				4.3
02A□AH7□□	1/33																											
04A□AH1□□	1/5	238.5	164.5	109	74	7.5	10	59	26	84	85 -0.035	90	105	9	36	38	26	36	20 -0.021	M5×10L	32	3.5	6	6				4.0
04A□AHB□□	1/11	256.5	172.5	117	84	12	12		32	96	100 -0.035	105	120		40	44	29	42	25 -0.021	M6×12L	36	4	8	7				4.6
04A□AHC□□	1/21	284.5	179.5	124	105	14	13		40	112	115 -0.035	120	135	11	45	60	33	58	32 -0.025	M8×16L	50	5	10	8				5.0
04A□AH7□□	1/33	285.5	180.5	125		12.5		84	40	114																		7.5

(2) 750 W and 1.5 kW



Model SGMPS-	Gear Ratio	L	LL	LM	LR	LE	LG	B	C	LD	LB	LC	LA	LZ	L1	L2	L3	Q	S	Tap × Depth	QK	U	W	T	Approx. Mass kg
08A□AH1□□	1/5	268	184	131	84	12	12	59	32	96	100 -0.035	105	120	9	40	44	29	42	25 -0.021	M6×12L	36	4	8	7	8.4
08A□AHB□□	1/11	297	192	139	105	14	13	59	40	112	115 -0.035	120	135	11	45	60	33	58	32 -0.025	M8×16L	50	5	10	8	9.5
08A□AHC□□	1/21	350	208	155	142	10	15	84	44	134	140 -0.04	145	165	14	57	85	40	82	40 -0.025	M10×20L	70		12		12.5
08A□AH7□□	1/33																								
15A□AH1□□	1/5	325	220	167	105	12.5	13	84	40	114	115 -0.035	120	135	11	45	60	33	58	32 -0.025	M8×16L	50	5	10	8	10.7
15A□AHB□□	1/11	378	236	183	142	10	15		44	134	140 -0.04	145	165	14	57	85	40	82	40 -0.025	M10×20L	70		12		12.8
15A□AHC□□	1/21	398	242	189	156	16	16	135	51	163	165 -0.04	170	190		70	86	51		45 -0.025			5.5	14	9	25.1
15A□AH7□□	1/33																								

Flange Output Type With Low-backlash Gears | Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Gear Mechanism: Planetary gear mechanism
Thermal Class: B

Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP55 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 3 minutes max.

Servomotor Model SGMPS-	Servomotor			Gears						Moment of Inertia ×10^{-4} kg·m^2	
	Output W	Rated Speed min^{-1}	Rated Torque N·m	Gear Ratio	Lost Motion arc-min	Rated Torque/ Efficiency ※2 N·m/%	Instantaneous Peak Torque N·m	Rated Speed min^{-1}	Max. Speed※1 min^{-1}	Motor + Gears	Gears
01A□AH10	100	3000	0.318	1/5	3	1.27/80	4.32	600	800	0.144	0.085
01A□AHB0				1/11		2.80/80	9.5	273	363	0.100	0.041
01A□AHC0				1/21		5.34/80	18.1	143	190	0.102	0.043
01A□AH70				1/33		8.40/80	27.0	91	121	0.085	0.026
02A□AH10	200	3000	0.637	1/5	3	2.55/80	8.6	600	800	0.543	0.280
02A□AHB0				1/11		5.62/80	18.9	273	363	0.364	0.101
02A□AHC0				1/21		10.7/80	36.1	143	190	0.351	0.088
02A□AH70				1/33		16.8/80	48.0※3	91	121	0.317	0.054
04A□AH10	400	3000	1.27	1/5	3	5.08/80	17.2	600	800	0.689	0.280
04A□AHB0				1/11		11.2/80	35.0	273	363	0.636	0.227
04A□AHC0				1/21		21.3/80	72.2	143	190	0.628	0.219
04A□AH70				1/33		33.5/80	93.0※3	91	121	0.545	0.136
08A□AH10	750	3000	2.39	1/5	3	9.56/80	32.0	600	800	2.72	0.616
08A□AHB0				1/11		21.0/80	56.0※3	273	363	2.65	0.552
08A□AHC0				1/21		40.2/80	134	143	190	2.65	0.552
08A□AH70				1/33		63.1/80	156※3	91	121	2.43	0.327
15A□AH10	1500	3000	4.77	1/5	3	19.1/80	64.4	600	800	5.59	1.57
15A□AHB0				1/11		42.0/80	142	273	363	5.58	1.56
15A□AHC0				1/21		80.1/80	270	143	190	5.90	1.88
15A□AH70				1/33		126/80	353※3	91	121	5.10	1.08

※1: Maximum motor speed is up to 4000 min^{-1} at the shaft.
※2: Gear output torque is expressed using the following equation.

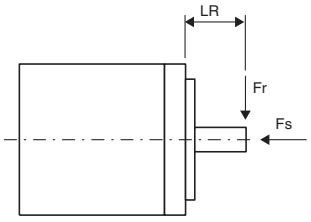
$$\text{(Gear output torque)} = \text{(servomotor output torque)} \times \frac{1}{\text{(gear ratio)}} \times \text{(efficiency)}$$

※3: The instantaneous peak torque values indicated with ※3 are limited by the gear, so use the following servomotor instantaneous peak torque. In this case, set torque parameters Pn402 and 403 for the SERVOPACK at 250%.
Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later.
This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

IMPORTANT
The SERVOPACK speed control range is 5000:1. When using servomotors at extremely low speeds (0.02 min^{-1} at gear output shaft), or when using servomotors with 1 pulse feed reference for extended periods etc., the gear bearing lubrication may be insufficient. That may cause deterioration of bearing or increase the load ratio.
Contact your Yaskawa representative if you are using your servomotor under these conditions.

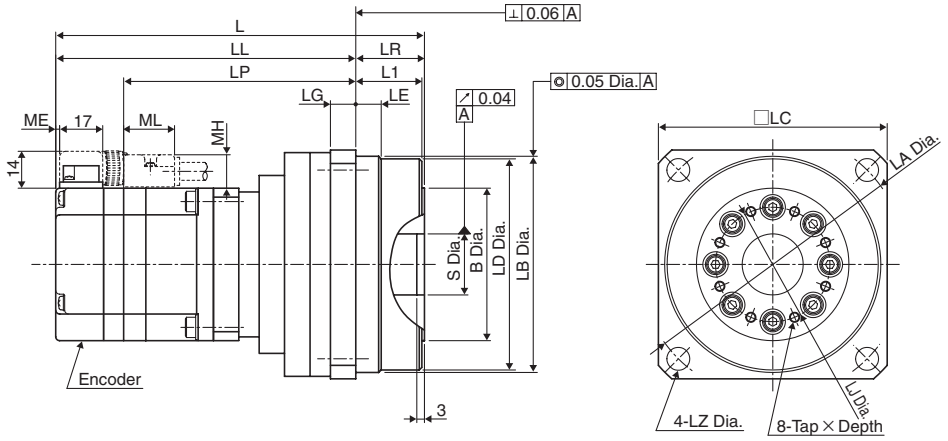
• Allowable Radial and Thrust Loads

Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model SGMPS-	Servomotors with Low-backlash Gears			
	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
01A□AH10	167	147	55	
01A□AHB0	216			
01A□AHC0	392	235	69	
01A□AH70	431			
02A□AH10	245	235	69	
02A□AHB0	323			
02A□AHC0	549	294	79	
02A□AH70	608			
04A□AH10	245	235	69	
04A□AHB0	441	294	79	
04A□AHC0	568	314	100	
04A□AH70	657			
08A□AH10	343	294	79	
08A□AHB0	451	314	100	
08A□AHC0	813	490	137	
08A□AH70	921			
15A□AH10	353	314	109	
15A□AHB0	647	490	137	
15A□AHC0	1274	882	151	
15A□AH70				

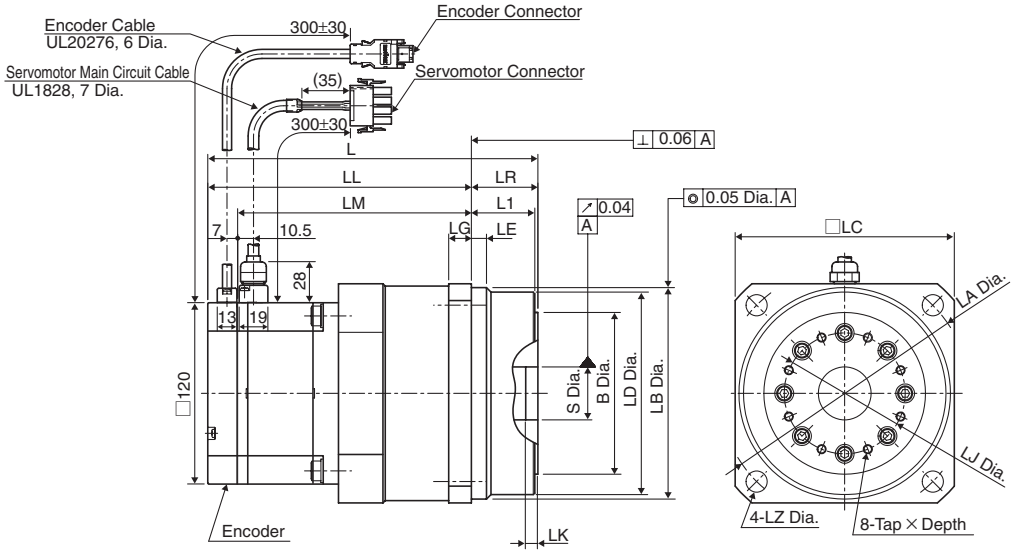
● Without Brakes

(1) 100 W to 400 W



Model SGMPS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ	L1	S	Tap × Depth	LJ	ME	MH	ML	Approx.Mass kg
01A□AH101	1/5	132	109	83	23	8	9	50	64.5	$65^{0}_{-0.03}$	70	80	6.6	22	$19^{+0.021}_{0}$	M3×6L	35	1	12	20	1.3
01A□AHB01	1/11																				1.4
01A□AHC01	1/21	145	118	92	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9	26	$24^{+0.021}_{0}$	M4×7L	45				2.4
01A□AH701	1/33																				
02A□AH101	1/5	150	123	99	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9	26	$24^{+0.021}_{0}$	M4×7L	45	1.5	13	21	2.9
02A□AHB01	1/11																				3.0
02A□AHC01	1/21	162	131	107	31	12	12	70	96	$100^{0}_{-0.035}$	105	120		29	$28^{+0.021}_{0}$	M5×8L	55				4.1
02A□AH701	1/33																				
04A□AH101	1/5	160	133	109	27	10	10	60	83	$85^{0}_{-0.035}$	90	105	9	26	$24^{+0.021}_{0}$	M4×7L	45				3.2
04A□AHB01	1/11	172	141	117	31	12	12	70	96	$100^{0}_{-0.035}$	105	120		29	$28^{+0.021}_{0}$	M5×8L	55				4.4
04A□AHC01	1/21	184	149	125	35	14	13	90	112	$115^{0}_{-0.035}$	120	135	11	33	$32^{+0.025}_{0}$	M5×8L	70				5.8
04A□AH701	1/33																				

(2) 750 W and 1.5 kW

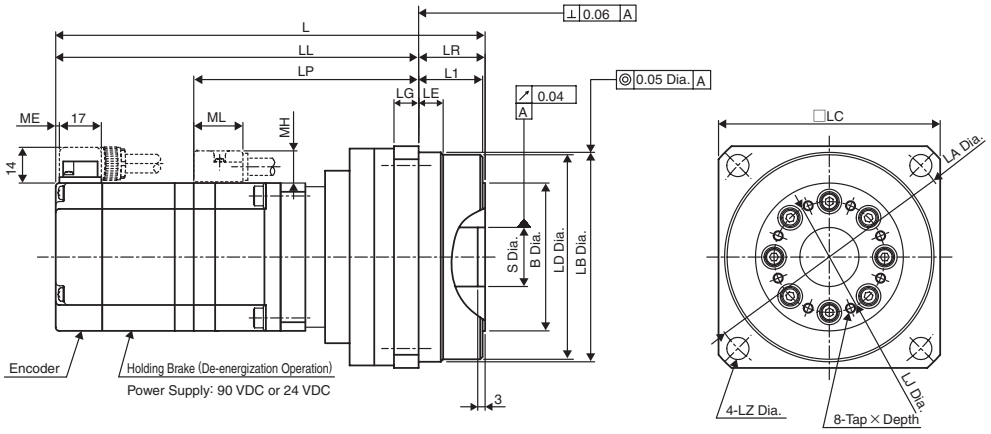


Model SGMPS-	Gear Ratio	L	LL	LM	LR	LE	LG	B	LD	LB	LC	LA	LZ	L1	LJ	LK	S	Tap × Depth	Approx. Mass kg
08A□AH101	1/5	181.5	150.5	131	31	12	12	70	96	$100^{0}_{-0.035}$	105	120	9	29	55	3	$28^{+0.021}_{0}$	M5×8L	6.9
08A□AHB01	1/11	193.5	158.5	139	35	14	13	90	112	$115^{0}_{-0.035}$	120	135	11	33	70		$32^{+0.025}_{0}$		8.6
08A□AHC01	1/21	218.5	174.5	155	44	10	15	107	134	$140^{0}_{-0.04}$	145	165	14	42	80	4	$35^{+0.025}_{0}$	M6×10L	12.2
08A□AH701	1/33																		
15A□AH101	1/5	221.5	186.5	167	35	12.5	13	90	112	$115^{0}_{-0.035}$	120	135	11	33	70	3	$32^{+0.025}_{0}$	M5×8L	11.6
15A□AHB01	1/11	246.5	202.5	183	44	10	15	107	134	$140^{0}_{-0.04}$	145	165	14	42	80	4	$35^{+0.025}_{0}$	M6×10L	15.8
15A□AHC01	1/21	261.5	208.5	189	53	16	16	135	163	$165^{0}_{-0.04}$	170	190		51	100	6	$47^{+0.025}_{0}$	M8×12L	20.5
15A□AH701	1/33																		

Flange Output Type With Low-backlash Gears | External Dimensions Units: mm

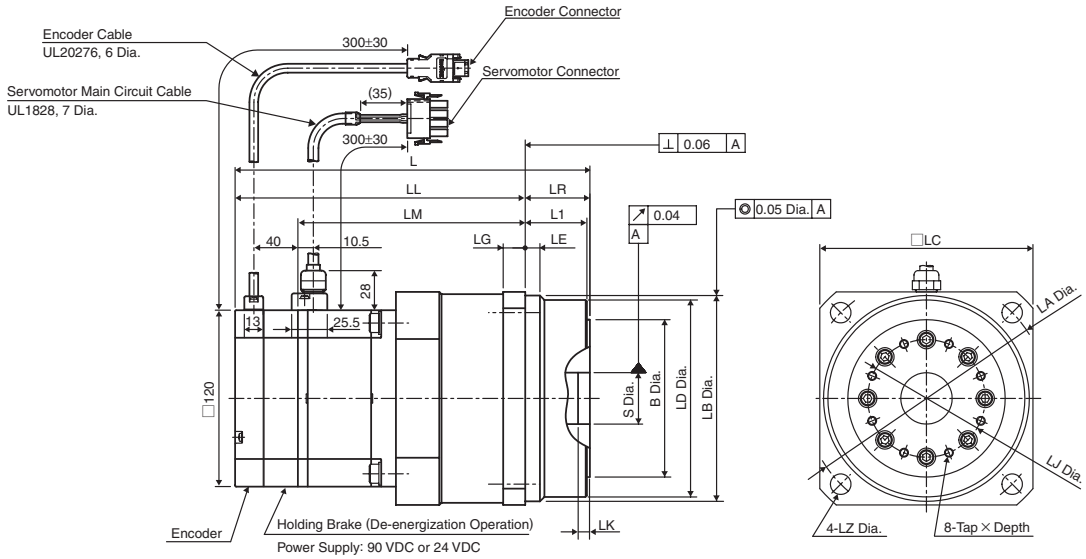
● With Brakes

(1) 100 W to 400 W



Model SGMPS-	Gear Ratio	L	LL	LP	LR	LE	LG	B	LD	LB	LC	LA	LZ	L1	S	Tap × Depth	LJ	ME	MH	ML	Approx. Mass kg
01A□AH10□	1/5	160	137	83	23	8	9	50	64.5	65 $^{0}_{-0.03}$	70	80	6.6	22	19 $^{+0.021}_{0}$	M3×6L	35	1	12	20	1.5
01A□AHB0□	1/11																				1.6
01A□AHC0□	1/21	173	146	92	27	10	10	60	83	85 $^{0}_{-0.035}$	90	105	9	26	24 $^{+0.021}_{0}$	M4×7L	45				2.6
01A□AH70□	1/33																				
02A□AH10□	1/5	181.5	154.5	99	27	10	10	60	83	85 $^{0}_{-0.035}$	90	105	9	26	24 $^{+0.021}_{0}$	M4×7L	45	1.5	13	21	3.4
02A□AHB0□	1/11																				3.5
02A□AHC0□	1/21	193.5	162.5	107	31	12	12	70	96	100 $^{0}_{-0.035}$	105	120		29	28 $^{+0.021}_{0}$	M5×8L	55				4.6
02A□AH70□	1/33																				
04A□AH10□	1/5	191.5	164.5	109	27	10	10	60	83	85 $^{0}_{-0.035}$	90	105	9	26	24 $^{+0.021}_{0}$	M4×7L	45				3.7
04A□AHB0□	1/11	203.5	172.5	117	31	12	12	70	96	100 $^{0}_{-0.035}$	105	120		29	28 $^{+0.021}_{0}$	M5×8L	55				4.9
04A□AHC0□	1/21	215.5	180.5	125	35	14	13	90	112	115 $^{0}_{-0.035}$	120	135	11	33	32 $^{+0.025}_{0}$		70				6.3
04A□AH70□	1/33																				

(2) 750 W and 1.5 kW



Model SGMPS-	Gear Ratio	L	LL	LM	LR	LE	LG	B	LD	LB	LC	LA	LZ	L1	LJ	LK	S	Tap × Depth	Approx. Mass kg
08A□AH10□	1/5	215	184	131	31	12	12	70	96	100 $^{0}_{-0.035}$	105	120	9	29	55	3	28 $^{+0.021}_{0}$	M5×8L	8.4
08A□AHB0□	1/11	227	192	139	35	14	13	90	112	115 $^{0}_{-0.035}$	120	135	11	33	70		32 $^{+0.025}_{0}$		10.1
08A□AHC0□	1/21	252	208	155	44	10	15	107	134	140 $^{0}_{-0.04}$	145	165	14	42	80	4	35 $^{+0.025}_{0}$	M6×10L	13.7
08A□AH70□	1/33																		
15A□AH10□	1/5	255	220	167	35	12.5	13	90	112	115 $^{0}_{-0.035}$	120	135	11	33	70	3	32 $^{+0.025}_{0}$	M5×8L	13.1
15A□AHB0□	1/11	280	236	183	44	10	15	107	134	140 $^{0}_{-0.04}$	145	165	14	42	80	4	35 $^{+0.025}_{0}$	M6×10L	17.3
15A□AHC0□	1/21	295	242	189	53	16	16	135	163	165 $^{0}_{-0.04}$	170	190		51	100	6	47 $^{+0.025}_{0}$	M8×12L	22.0
15A□AH70□	1/33																		

Servomotors

SGMSS

Model Designation

●Without Gears

SGMSS - 10 A 2 A 2 1

1st+2nd digits	3rd digit	4th digit	5th digit	6th digit	7th digit

Σ-Ⅲ series SGMSS servomotor

1st + 2nd digits Rated Output

Code	Specifications
10	1.0 kW
15	1.5 kW
20	2.0 kW
25	2.5 kW
30	3.0 kW
40	4.0 kW
50	5.0 kW
70	7.0 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)
C	17-bit incremental encoder (standard)

Note: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
A	Standard

6th digit Shaft End

Code	Specifications
2	Straight without key (standard)
3	Taper 1/10, with key (optional)
6	Straight with key and tap (optional)

7th digit Options

Code	Specifications
1	Without options
B	With 90-VDC brakes
C	With 24-VDC brakes
D	With oil seal and 90-VDC brakes
E	With oil seal and 24-VDC brakes
S	With oil seal

Note: SGMSS servomotors with a 4-kW, 5-kW, or 7-kW capacity do not have brakes.

Features

- Super high power
- Wide selection: 1.0 kW to 7.0 kW capacity, brake and gear options
- Mounted encoder: 17-bit, high resolution
- Standard protection level: IP67 (Not including the IP22-compliant enclosure for 7.0 kW motor)

Application Examples

- Chip mounters
- PCB drilling stations
- Machine tool feeders

●With Gears

SGMSS - 10 A 2 A L 1 4 1

Σ-Ⅲ series SGMSS servomotor	1st+2nd digits	3rd digit	4th digit	5th digit	6th digit	7th digit	8th digit	9th digit

1st + 2nd digits Rated Output

Code	Specifications
10	1.0 kW
15	1.5 kW
20	2.0 kW
25	2.5 kW
30	3.0 kW
40	4.0 kW
50	5.0 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)
C	17-bit incremental encoder (standard)

Note: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
A	Standard

6th digit Gears

Code	Specifications
L	Low-backlash gears

7th digit Gear Ratio

Code	Specifications
1	1/5
2	1/9
5	1/20
7	1/29 (Not applicable for 5.0-kW motors)
8	1/45 (Not applicable for 4.0-kW and 5.0-kW motors)

8th digit Shaft End

Code	Specifications
4	Straight with key

9th digit Options

Code	Specifications
1	Without brakes
B	With 90-VDC brakes
C	With 24-VDC brakes

Note: SGMSS servomotors with a 4-kW, 5-kW, or 7-kW capacity do not have brakes.

Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method

Thermal Class: F
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP67
(except for shaft opening)
Note: IP22 for SGMSS-70 servomotors.
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

Voltage		200 V							
Servomotor Model SGMSS-□□□□□		10A□A	15A□A	20A□A	25A□A	30A□A	40A□A	50A□A	70A□A
Rated Output*1	kW	1.0	1.5	2.0	2.5	3.0	4.0	5.0	7.0
Rated Torque*1, *2	N·m	3.18	4.90	6.36	7.96	9.80	12.6	15.8	22.3
Instantaneous Peak Torque*1	N·m	9.54	14.7	19.1	23.9	29.4	37.8	47.6	54
Rated Current*1	Arms	5.7	9.3	12.1	13.8	17.9	25.4	27.6	38.3
Instantaneous Max. Current*1	Arms	17	28	42	44.5	56	77	84	105
Rated Speed*1	min^{-1}	3000							
Max. Speed*1	min^{-1}	6000	5000						
Torque Constant	N·m/Arms	0.636	0.590	0.561	0.610	0.581	0.520	0.600	0.600
Rated Moment of Inertia	$kg·m^2×10^{-4}$	1.74 (1.99)	2.00 (2.25)	2.47 (2.72)	3.19 (3.44)	7.00 (9.1)	9.60	12.3	12.3
Rated Power Rate*1	kW/s	58.1	120	164	199	137	165	203	404
Rated Angular Acceleration*1	rad/s^2	18300	24500	25700	25000	14000	13100	12800	18100

*1: These items and torque-motor speed characteristics quoted in combination with an SGDS SERVOPACK are at an armature winding temperature of 20℃.
*2: These characteristics are values with the following aluminum plate (heat sink) attached for cooling.
・SGMSS-10, 15, 20, 25 : 300×300×12 (mm)
・SGMSS-30, 40, 50, 70 : 400×400×20 (mm)
Note: The values in parentheses are for servomotors with holding brakes.

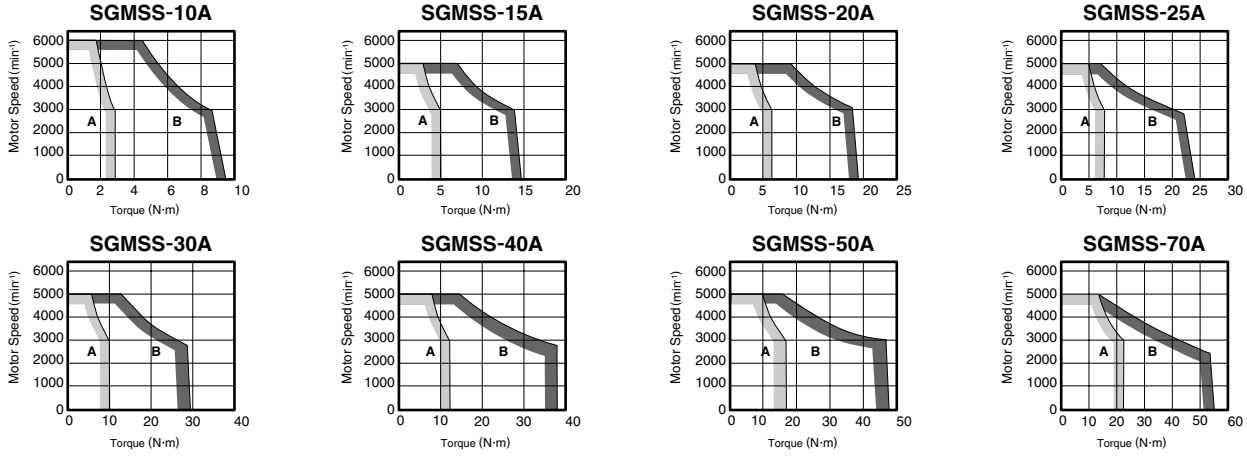
● Holding Brake Electrical Specifications

Holding Brake Rated Voltage	Servomotor Model	Servomotor Capacity W	Holding Brake Specifications			
			Capacity W	Holding Torque N·m	Coil Resistance Ω (at 20℃)	Rated Current A (at 20℃)
90 VDC	SGMSS-10	1000	7	4.3	1150	0.078
	SGMSS-15	1500	12	7.84	675	0.13
	SGMSS-20	2000	12	7.84	675	0.13
	SGMSS-25	2500	12	10	675	0.13
	SGMSS-30	3000	20	20	405	0.222
24 VDC	SGMSS-10	1000	7	4.3	82	0.29
	SGMSS-15	1500	12	7.84	48	0.5
	SGMSS-20	2000	12	7.84	48	0.5
	SGMSS-25	2500	12	10	48	0.5
	SGMSS-30	3000	20	20	28.8	0.833

Note: The holding brake is only used to hold the load and cannot be used to stop the servomotor.

● Torque–motor Speed Characteristics

A Continuous Duty Zone B Intermittent Duty Zone



Ratings and Specifications

● Allowable Load Moment of Inertia at the Motor Shaft

The rotor moment of inertia ratio is the value for a servomotor without a gear and a brake.

Servomotor	Capacity Range	Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)
SGMSS	1.0 kW	×5
	1.5 kW	×5
	2.0 kW	×5
	2.5 kW	×5
	3.0 kW	×5
	4.0 kW	×5
	5.0 kW	×5
	7.0 kW	×5

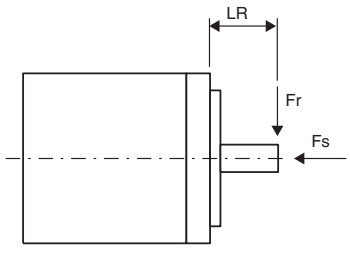
● Load Moment of Inertia

The larger the load moment of inertia, the worse the movement response of the load.
The size of the load moment of inertia (J_L) allowable when using a servomotor depends on motor capacity and is limited to within 5 to 30 times the moment of inertia of each servomotor (J_M). This value is provided strictly as a guideline and results may vary depending on servomotor drive conditions.
An overvoltage alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a regeneration overload alarm (A.320). Take one of the following steps if this occurs.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared. Contact your Yaskawa Application Engineering Department.

● Allowable Radial and Thrust Loads

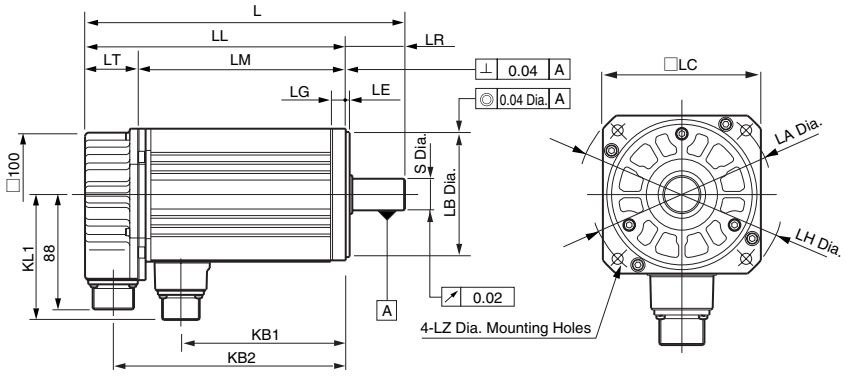
Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

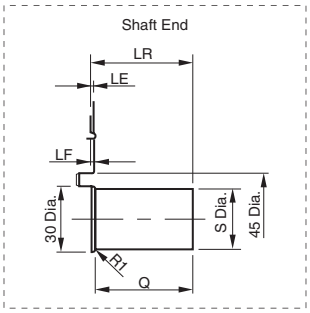
Servomotor Model		Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
SGMSS-	10A	686	196	45	
	15A				
	20A				
	25A				
	30A	980	392	63	
	40A	1176			
	50A				
	70A				

External Dimensions Units: mm

● Without Brakes

(1) 1.0 kW to 5.0 kW





Note: For the specifications of the other shaft ends, refer to page 96.

Model SGMSS-	L	LL	LM	LR	LT	KB1	KB2	KL1	Flange Face Dimensions								Shaft-end Dimensions		Approx. Mass kg
									LA	LB	LC	LE	LF	LG	LH	LZ	S	Q	
10A□A21	194	149	103	45	46	76	128	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	4.6
15A□A21	205	160	116	45	44	87	139	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	5.1
20A□A21	220	175	131	45	44	102	154	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	5.8
25A□A21	249	204	154	45	50	125	183	96	115	$95^{0}_{-0.035}$	100	3	3	10	130	7	$24^{0}_{-0.013}$	40	7.0
30A□A21	262	199	155	63	44	124	178	114	145	$110^{0}_{-0.035}$	130	6	6	12	165	9	$28^{0}_{-0.013}$	55	11
40A□A21	299	236	192	63	44	161	215	114	145	$110^{0}_{-0.035}$	130	6	6	12	165	9	$28^{0}_{-0.013}$	55	14
50A□A21	339	276	232	63	44	201	255	114	145	$110^{0}_{-0.035}$	130	6	6	12	165	9	$28^{0}_{-0.013}$	55	17

Note: Models with oil seals are of the same configuration.

● Connector Specifications for Encoder (17-bit Encoder)

Receptacle: MS3102A20-29P
Applicable plug (To be provided by the customer)
Plug: MS3108B20-29S
Cale clamp: MS3057-12A

With an Absolute Encoder

A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA−	N	—
E	—	P	—
F	—	R	—
G	0V	S	BATT−
H	+5 VDC	T	BATT+
J	FG (Frame ground)	—	—

With an Incremental Encoder

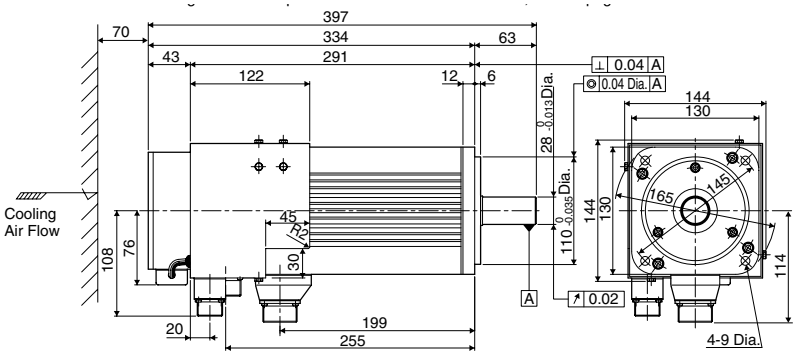
A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA−	N	—
E	—	P	—
F	—	R	—
G	0V	S	—
H	+5 VDC	T	—
J	FG (Frame ground)	—	—

● Connector Specifications for Servomotor

A	Phase U
B	Phase V
C	Phase W
D	FG (Frame ground)

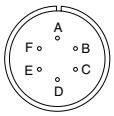
(2) 7.0 kW

Note: Leave a minimum space of 70 mm around the servomotor to allow for a sufficient amount of cooling air.
For the specifications of the other shaft ends, refer to page 96.



Approx. Mass: 18.5 kg

● Connector Specifications for Fan



Receptacle: MS3102A14S-6P
Applicable plug (To be provided by the customer)
Plug: MS3108B14S-6S
Cable clamp: MS3057-6A

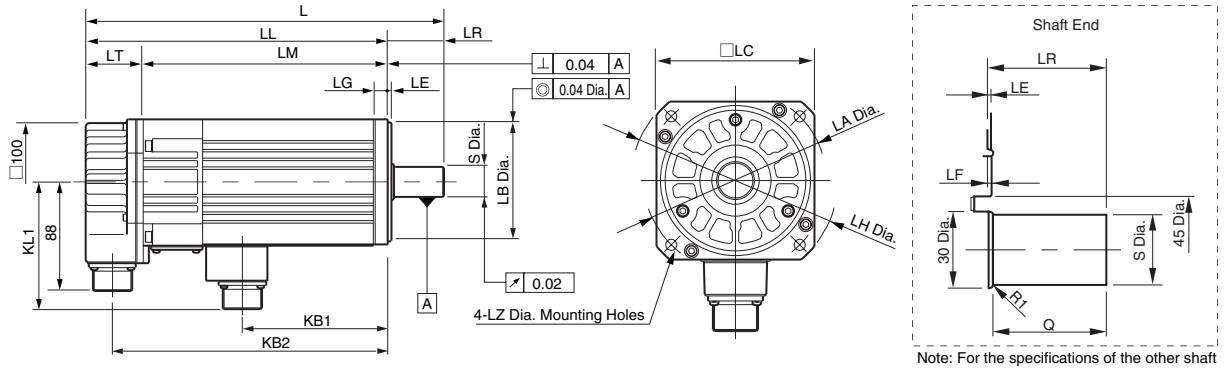
A	Fan motor
B	Fan motor
C	
D	Alarm terminal
E	Alarm terminal
F	FG (Frame ground)

Note: The connector specifications for the encoder and servomotor are same as those for the SGMSS-30 to the SGMSS-50 servomotors without brakes.

External Dimensions Units: mm

● With Brakes

(1) 1.0 kW to 3.0 kW



Note: For the specifications of the other shaft ends, refer to page 96.

Model SGMSS-	L	LL	LM	LR	LT	KB1	KB2	KL1	Flange Face Dimensions								Shaft-end Dimensions		Approx.
									LA	LB	LC	LE	LF	LG	LH	LZ	S	Q	Mass kg
10A□A2□	238	193	147	45	46	67	171	102	115	95 $^{0}_{-0.035}$	100	3	3	10	130	7	24 $^{0}_{-0.013}$	40	6.0
15A□A2□	252	207	157	45	50	77	185	102	115	95 $^{0}_{-0.035}$	100	3	3	10	130	7	24 $^{0}_{-0.013}$	40	6.8
20A□A2□	268	223	173	45	50	93	201	102	115	95 $^{0}_{-0.035}$	100	3	3	10	130	7	24 $^{0}_{-0.013}$	40	7.5
25A□A2□	300	255	205	45	50	115	233	102	115	95 $^{0}_{-0.035}$	100	3	3	10	130	7	24 $^{0}_{-0.013}$	40	10
30A□A2□	298	235	191	63	44	114	214	119	145	110 $^{0}_{-0.035}$	130	6	6	12	165	9	28 $^{0}_{-0.013}$	55	13

Note: Models with oil seals are of the same configuration.

● Connector Specifications for Encoder (17-bit Encoder)

Receptacle: MS3102A20-29P
Applicable plug (To be provided by the customer)
Plug: MS3108B20-29S
Cable clamp: MS3057-12A

With an Absolute Encoder

A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA–	N	—
E	—	P	—
F	—	R	—
G	0V	S	BATT–
H	+5 VDC	T	BATT+
J	FG (Frame ground)	—	—

With an Incremental Encoder

A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA–	N	—
E	—	P	—
F	—	R	—
G	0V	S	—
H	+5 VDC	T	—
J	FG (Frame ground)	—	—

● Connector Specifications for Servomotor

A	Phase U	E	Brake terminal
B	Phase V	F	Brake terminal
C	Phase W	G	—
D	FG (Frame ground)	—	—

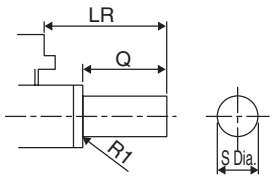
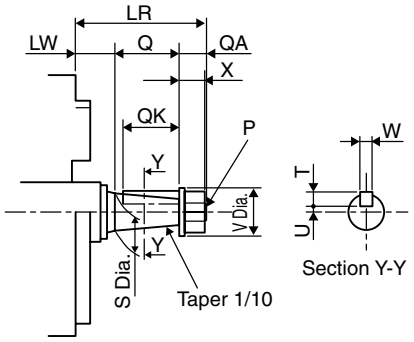
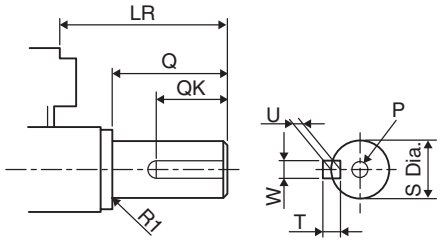
Note: No polarity for connection to the brake

External Dimensions Units: mm

● Shaft End Specifications

SGMSS - □□□□□□□

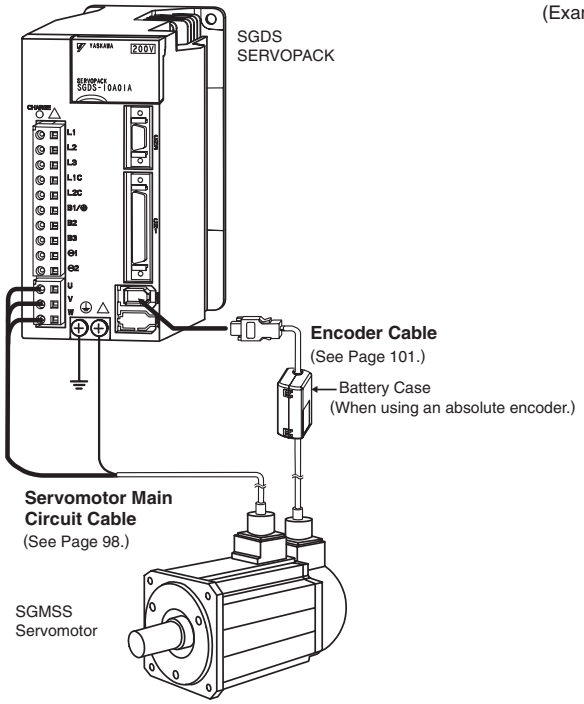
Symbol	Specifications	Remarks
2	Straight, without key	Standard
3	Taper 1/10, with parallel key (Key slot is JISB1301-1976 high precision.)	Optional
6	Straight, with key and tap for one location (Key slot is JISB1301-1976 high precision. Key slot tolerance is JISB1301. Both key and tap are included.)	Optional

Symbol	Specifications	Shaft End		SGMSS-							
				10	15	20	25	30	40	50	70
2	Straight, without Key		LR	45				63			
			Q	40				55			
			S	$24^{0}_{-0.013}$				$28^{0}_{-0.013}$			
3	Taper 1/10, with Parallel Key		LR	70				80			
			LW	20							
			Q	36				42			
			QA	14				18			
			QK	32				36			
			X	12.5				16			
			S	24				28			
			V	24				30			
			P	M12, P1.25				M16, P1.5			
			W	8							
			T	7							
			U	7.1				8.95			
6	Straight, with Key and Tap		LR	45				63			
			Q	40				55			
			QK	32				50			
			S	$24^{0}_{-0.013}$				$28^{0}_{-0.013}$			
			W	8							
			T	7							
			U	4							
			P	M8 screw, depth: 16							

Selecting Cables

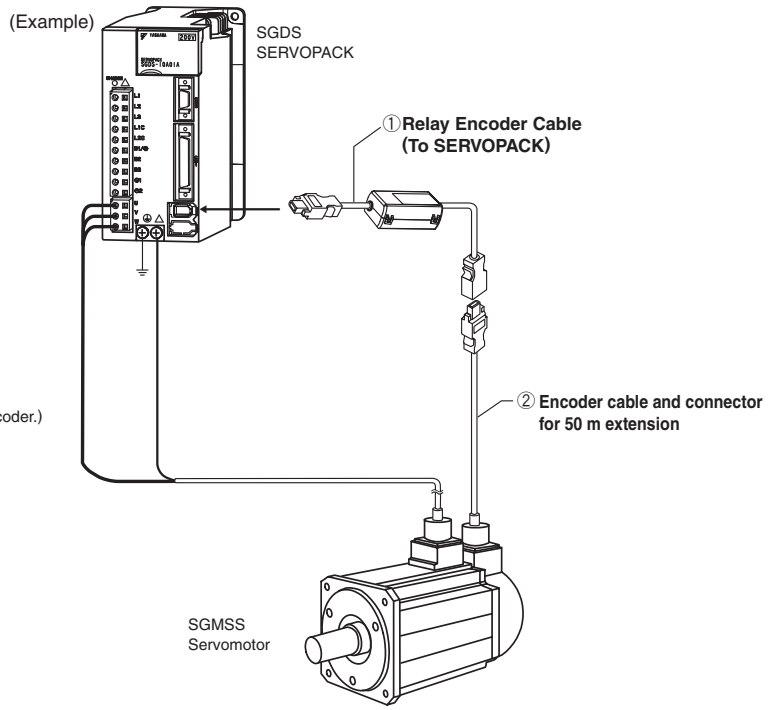
● Cable Connections

● For Standard Wiring



● For Encoder Cable Extensions from 30 m up to 50 m

(See Page 103.)



⚠ CAUTION
Separate the servomotor main circuit wiring from the I/O signal cable and encoder cable at least 30 cm, and do not bundle or run them in the same duct.

Selecting Cables

● Servomotor Main Circuit Cables

Customers must assemble the servomotor's main circuit cables and attach connectors to connect the SERVOPACKs and the SGMSS servomotors.

Use the connectors specified by Yaskawa when assembling the cable. Select the appropriate type of connector in accordance with the motor application. The following two types of connectors are available for SGMSS servomotors.

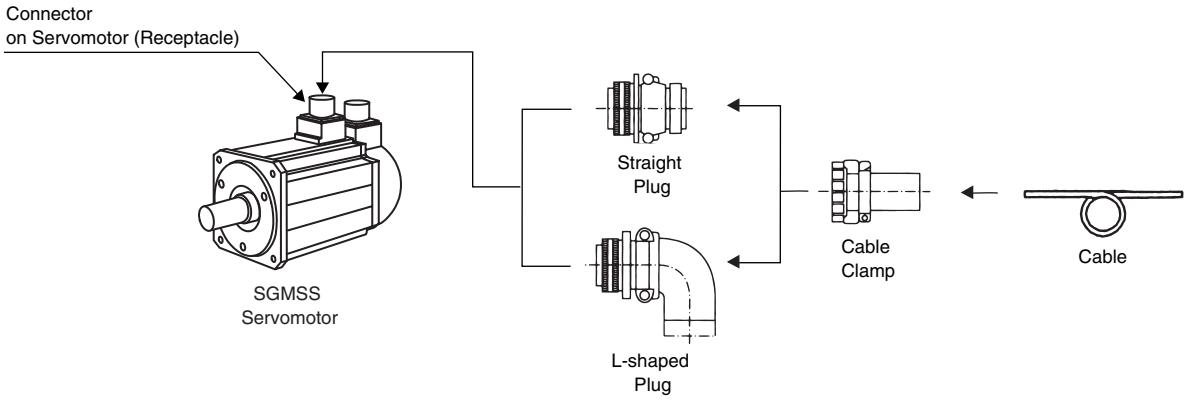
· Standard

· IP67 rated and compliant to European Safety standards

The cables have no restrictions. Use appropriate cable for the connectors.

● Connectors: Standard

(1) Connector Configuration



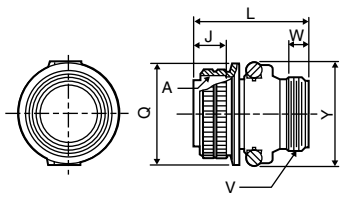
(2) Connector Combination List

Servomotor Type	Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor		
			Straight Plug	L-shaped Plug	Cable Clamp
Without Brakes	1.0 1.5 2.0 2.5	MS3102A18-10P	MS3106B18-10S	MS3108B18-10S	MS3057-10A
	3.0 4.0 5.0 7.0	MS3102A22-22P	MS3106B22-22S	MS3108B22-22S	MS3057-12A
With Brakes	1.0 1.5 2.0 2.5	MS3102A20-15P	MS3106B20-15S	MS3108B20-15S	MS3057-12A
	3.0	MS3102A24-10P	MS3106B24-10S	MS3108B24-10S	MS3057-16A

Selecting Cables Units: mm

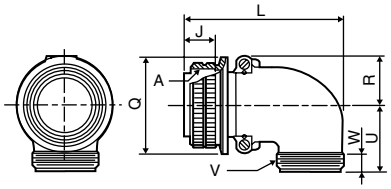
(3) Dimensional Drawings: Cable Connectors to Servomotors

- MS3106B□□-□□S: Straight Plug



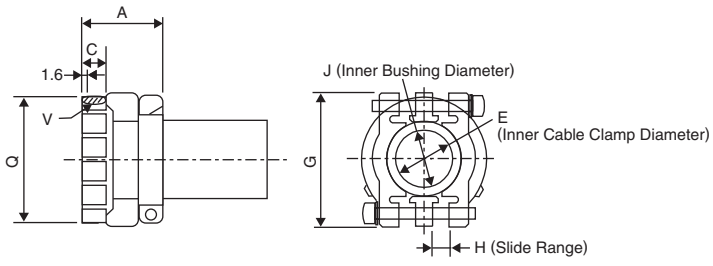
Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L max.	Outer Diameter of Joint Nut $Q^{+0}_{-0.38}$	Cable Clamp Set Screw V	Effective Screw Length W min.	Maxmum Width Y max.
18	1-1/8-18UNEF	18.26	52.37	34.13	1-20UNEF	9.53	42
20	1-1/4-18UNEF	18.26	55.57	37.28	1-3/16-18UNEF	9.53	47
22	1-3/8-18UNEF	18.26	55.57	40.48	1-3/16-18UNEF	9.53	50
24	1-1/2-18UNEF	18.26	58.72	43.63	1-7/16-18UNEF	9.53	53

- MS3108B□□-□□S: L-shaped Plug



Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L max.	Outer Diameter of Joint Nut $Q^{+0}_{-0.38}$	R ±0.5	U ±0.5	Cable Clamp Set Screw V	Effective Screw Length W min.
18	1-1/8-18UNEF	18.26	68.27	34.13	20.5	30.2	1-20UNEF	9.53
20	1-1/4-18UNEF	18.26	76.98	37.28	22.5	33.3	1-3/16-18UNEF	9.53
22	1-3/8-18UNEF	18.26	76.98	40.48	24.1	33.3	1-3/16-18UNEF	9.53
24	1-1/2-18UNEF	18.26	86.51	43.63	25.6	36.5	1-7/16-18UNEF	9.53

- MS3057-□□A: Cable Clamp with Rubber Bushing

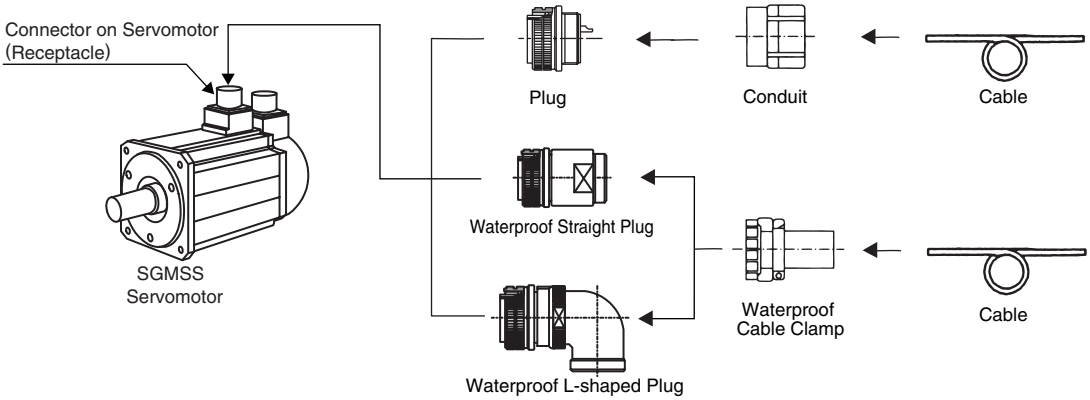


Cable Clamp Type	Applicable Connector Shell Size	Overall Length A±0.7	Effective Screw Length C	E	G±0.7	H	J	Set Screw V	Outer Diameter Q±0.7	Attached Bushing
MS3057-10A	18	23.8	10.3	15.9	31.7	3.2	14.3	1-20UNEF	30.1	AN3420-10
MS3057-12A	20,22	23.8	10.3	19.0	37.3	4.0	15.9	1-3/16-18UNEF	35.0	AN3420-12
MS3057-16A	24	26.2	10.3	23.8	42.9	4.8	19.1	1-7/16-18UNEF	42.1	AN3420-16

Selecting Cables

● Connectors: IP67 Rated and European Safety Standards

(1) Connector Configuration



(2) Connector Combination List

Servo-motor Type	Capa-city kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor					
			Plug	End Bell or Back Shell*1		Cable Clamp*2	Applicable Cable Range (For Reference) mm	Manufacturer
				Straight Plug	L-shaped Plug (Angled)			
Without Brakes	1.0 1.5 2.0 2.5	CE05-2A18-10PD-B	CE05-6A18-10SD-B	CE05-6A18-10SD-B-BSS	CE05-8A18-10SD-B-BAS	CE3057-10A-1	10.5 to 14.1 dia.	DDK Ltd.
						CE3057-10A-2	8.5 to 11.0 dia.	
						CE3057-10A-3	6.5 to 8.7 dia.	
	3.0 4.0 5.0 7.0	JL04HV-2E22-22PE-B	JL04V-6A22-22SE	JL04V-6A22-22SE-EB or JA06A-22-22S-J1-EB*3	JL04V-8A22-22SE-EB or JA08A-22-22S-J1-EB*3	JL04-2022CK(09)	6.5 to 9.5 dia.	Japan Aviation Electronics Industry, Ltd.
						JL04-2022CK(12)	9.5 to 13.0 dia.	
						JL04-2022CK(14)	12.9 to 15.9 dia.	
With Brakes	1.0 1.5 2.0 2.5	JL04V-2E20-15PE-B	JL04V-6A20-15SE	JL04V-6A20-15SE-EB	JL04V-8A20-15SE-EB	JL04-2022CK(09)	6.5 to 9.5 dia.	
						JL04-2022CK(12)	9.5 to 13.0 dia.	
						JL04-2022CK(14)	12.9 to 15.9 dia.	
	3.0	JL04V-2E24-10PE-B	JL04-6A24-10SE	JL04V-6A24-10SE-EB or JA06A-24-10S-J1-EB*3	JL04V-8A24-10SE-EB or JA08A-24-10S-J1-EB*3	JL04-2428CK(11)	9.0 to 12.0 dia.	
						JL04-2428CK(14)	12.0 to 15.0 dia.	
						JL04-2428CK(17)	15.0 to 18.0 dia.	
						JL04-2428CK(20)	18.0 to 20.0 dia.	

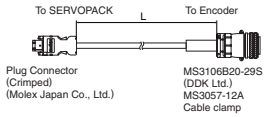
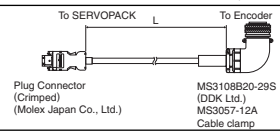
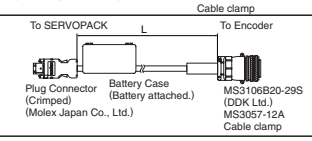
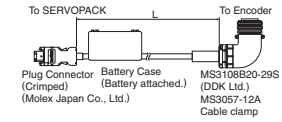
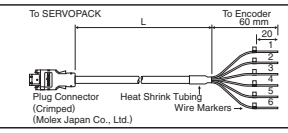
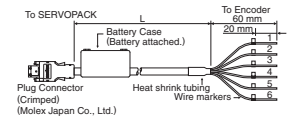
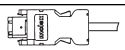
*1: End Bell is a product of Japan Aviation Electronics Industry, Ltd.
Back Shell is a product of DDK Ltd.

*2: Select cable clamps according to the cable diameter.

*3: The following plugs conform to IP67 protective construction, but not conform to European Safety Standards.
- For 3.0 kW, 4.0 kW, 5.0 kW, and 7.0 kW servomotors without brakes
  Straight plug: JA06A-22-22S-J1-EB
  L-shaped plug: JA08A-22-22S-J1-EB
- For 3.0 kW servomotors with brakes
  Straight plug: JA06A-24-10S-J1-EB
  L-shaped plug: JA08A-24-10S-J1-EB

Selecting Cables

● Encoder Cables and Connectors (For Standard Wiring)

Name	Length L	Order No. Standard Cable	Order No. Flexible Cable*	Specifications	Details
Encoder Cable with Connectors (For Incremental Encoder)	3 m	JZSP-CMP01-03-E	JZSP-CMP11-03-E		(1)
	5 m	JZSP-CMP01-05-E	JZSP-CMP11-05-E		
	10 m	JZSP-CMP01-10-E	JZSP-CMP11-10-E		
	15 m	JZSP-CMP01-15-E	JZSP-CMP11-15-E		
	20 m	JZSP-CMP01-20-E	JZSP-CMP11-20-E		
	3 m	JZSP-CMP02-03-E	JZSP-CMP12-03-E		
	5 m	JZSP-CMP02-05-E	JZSP-CMP12-05-E		
	10 m	JZSP-CMP02-10-E	JZSP-CMP12-10-E		
	15 m	JZSP-CMP02-15-E	JZSP-CMP12-15-E		
	20 m	JZSP-CMP02-20-E	JZSP-CMP12-20-E		
Encoder Cable with Connectors (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP06-03-E	JZSP-CSP26-03-E		(2)
	5 m	JZSP-CSP06-05-E	JZSP-CSP26-05-E		
	10 m	JZSP-CSP06-10-E	JZSP-CSP26-10-E		
	15 m	JZSP-CSP06-15-E	JZSP-CSP26-15-E		
	20 m	JZSP-CSP06-20-E	JZSP-CSP26-20-E		
	3 m	JZSP-CSP07-03-E	JZSP-CSP27-03-E		
	5 m	JZSP-CSP07-05-E	JZSP-CSP27-05-E		
	10 m	JZSP-CSP07-10-E	JZSP-CSP27-10-E		
	15 m	JZSP-CSP07-15-E	JZSP-CSP27-15-E		
	20 m	JZSP-CSP07-20-E	JZSP-CSP27-20-E		
Encoder Cable with Loose Wires at Encoder End (For Incremental Encoder)	3 m	JZSP-CMP03-03-E	JZSP-CMP13-03-E		(3)
	5 m	JZSP-CMP03-05-E	JZSP-CMP13-05-E		
	10 m	JZSP-CMP03-10-E	JZSP-CMP13-10-E		
	15 m	JZSP-CMP03-15-E	JZSP-CMP13-15-E		
	20 m	JZSP-CMP03-20-E	JZSP-CMP13-20-E		
Encoder Cable with Loose Wires at Encoder End (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP04-03-E	JZSP-CSP24-03-E		(4)
	5 m	JZSP-CSP04-05-E	JZSP-CSP24-05-E		
	10 m	JZSP-CSP04-10-E	JZSP-CSP24-10-E		
	15 m	JZSP-CSP04-15-E	JZSP-CSP24-15-E		
	20 m	JZSP-CSP04-20-E	JZSP-CSP24-20-E		
Connector Kit to SERVOPACK		JZSP-CMP9-1-E		Soldered 	(5)
Connectors to Encoder for Standard (Connector on Servomotor: MS3102A20-29P)		MS3106B20-29S		Straight plug 	—
		MS3108B20-29S		L-shaped plug 	
		MS3057-12A		Cable clamp 	
Connectors to Encoder for IP67/European Safety Standards (Connector on Servomotor: 97F3102E20-29P)		JA06A-20-29S-J1-EB		Straight plug 	
		JA08A-20-29S-J1-EB		L-shaped plug 	
		JL04-2022CKE (09) Cable diameter: 6.5 to 9.5 mm		Cable clamp 	
		JL04-2022CKE (12) Cable diameter: 9.5 to 13 mm			
		JL04-2022CKE (14) Cable diameter: 12.9 to 15.9 mm			
Cables	5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	20 m Max. 	(6)
	10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E		
	15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E		
	20 m	JZSP-CMP09-20-E	JZSP-CSP39-20-E		

*: Use flexible cables for movable sections such as robot arms.

(1) Wiring for Cable with Connectors (For Incremental Encoder)

To SERVOPACK

Pin No.	Signal
5	PS
6	/PS
2	PG0V
1	PG5V
4	BAT(–)
3	BAT(+)
Shell	FG

Shield Wire

To Encoder (Servomotor)

Pin No.	Lead Color	
	Standard	Flexible
C	Light blue	Red/light blue
D	Light blue/white	Black/light blue
G	Black	Green
H	Red	Orange
S	Orange/white	Black/pink
T	Orange	Red/pink
J	FG Shield	FG

(2) Wiring for Cable with Connectors (For Absolute Encoder, with a Battery Case)

To SERVOPACK

Pin No.	Signal
5	PS
6	/PS
2	PG0V
1	PG5V
4	BAT(–)
3	BAT(+)
Shell	FG

Shield Wire

Battery Case

Pin No.	Signal
2	BAT(–)
1	BAT(+)

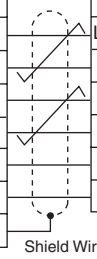
To Encoder (Servomotor)

Pin No.	Lead Color	
	Standard	Flexible
C	Light blue	Red/light blue
D	Light blue/white	Black/light blue
G	Black	Green
H	Red	Orange
S	Orange/white	Black/pink
T	Orange	Red/pink
J	FG Shield	FG

(3) Wiring for Cable with Loose Wires to Encoder (For Incremental Encoder)

To SERVOPACK

Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG0V
1	PG5V
Shell	FG



To Encoder (Servomotor)

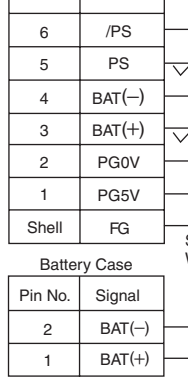
Lead Color		Marker
Standard	Flexible	
Light blue/white	Black/light blue	6
Light blue	Red/light blue	5
Orange/white	Black/pink	4
Orange	Red/pink	3
Black	Green	2
Red	Orange	1

Notes: 1 The signals BAT (+) and BAT (–) are used when using an absolute encoder.
2 Be sure to connect the shield wire of encoder cable to the connector case (shell).

(4) Wiring for Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)

To SERVOPACK

Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG0V
1	PG5V
Shell	FG



Battery Case

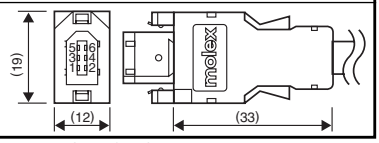
Pin No.	Signal
2	BAT(–)
1	BAT(+)

To Encoder (Servomotor)

Lead Color		Marker
Standard	Flexible	
Light blue/white	Black/pink	6
Light blue	Red/pink	5
Orange/white	Black/light blue	4
Orange	Red/light blue	3
Black	Green	2
Red	Orange	1

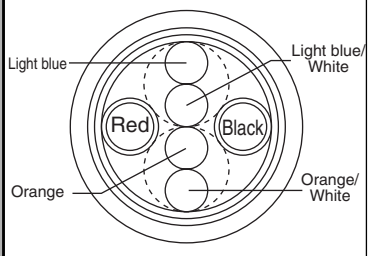
Note: Be sure to connect the shield wire of encoder cable to the connecter case (shell).

(5) Connector Kits to SERVOPACK

Items	Specifications
Order No.	JZSP-CMP9-1-E
Manufacturer	Molex Japan Co., Ltd.
Connector Model No. (For Standard)	55100-0670 (soldered)
Dimensional Drawings (Units: mm)	

Note: The mating connector model No. on SERVOPACK: 54280-0800

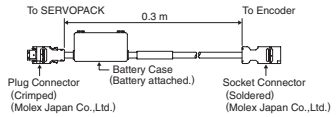
(6) Cables

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CMP09-□□-E	JZSP-CSP39-□□-E
Cable Length	20 m max.	
Specifications	UL20276 (Max. operating temperature: 80°C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.15 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.09 mm	UL20276 (Max. operating temperature: 80°C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.35 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.21 mm
Finished Dimensions	6.5 dia. mm	6.8 dia. mm
Internal Configuration and Lead Color		
Yaskawa Standards Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□ of order No.
Example: JZSP-CSM09-05-E (5 m)

Selecting Cables

● Encoder Cables and Connectors (For Extending from 30 m up to 50 m)

Name		Length	Order No.	Specifications	Details
① Relay Encoder Cable (for Relay)	To SERVOPACK (For Absolute Encoder, with a Battery Case)	0.3 m	JZSP-CSP-12-E*		(1)
② Encoder cable and connector for 50 m extension	Connector to Encoder for Standard (Connector on Servomotor: MS3102A20-29P)		MS3106B20-29S	Straight Plug 	—
			MS3108B20-29S	L-shaped Plug 	
			MS3057-12A	Cable Clamp 	
	Connector to Encoder for IP67/European Safety Standards (Connector on Servomotor: 97F3102E20-29P)		JA06A-20-29S-J1-EB	Straight Plug 	
			JA08A-20-29S-J1-EB	L-shaped Plug 	
			JL04-2022CKE (09) Cable diameter: 6.5 to 9.5 mm	Cable Clamp 	
			JL04-2022CKE (12) Cable diameter: 9.5 to 13 mm		
			JL04-2022CKE (14) Cable diameter: 12.9 to 15.9 mm		
	30 m to 50 m encoder cables are available.	30 m	JZSP-CMP19-30-E	50 m Max. 	(2)
		40 m	JZSP-CMP19-40-E		
		50 m	JZSP-CMP19-50-E		

*: Not required if using an incremental encoder or if using an absolute encoder with a battery connected to the host controller.

(1) Wiring for Relay Encoder Cable to SERVOPACK (For Absolute Encoder, with a Battery Case)

To SERVOPACK

Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG0V
1	PG5V
Shell	FG

Battery Case

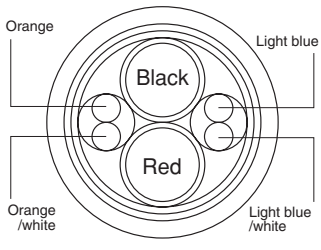
Pin No.	Signal
2	BAT(–)
1	BAT(+)

Shield Wire

To Encoder (Servomotor)

Pin No.	Lead Color
6	Light blue/white
5	Light blue
4	Orange/white
3	Orange
2	Black
1	Red
Shell	FG

(2) Specification of 50 m encoder cable extension

Items	Standard Cable
Order No.*	JZSP-CMP19-□□-E
Cable Length	50 m max.
Specifications	UL20276 (Max. operating temperature: 80℃) AWG16×2C+AWG26×2P AWG16 (1.31 mm²) Outer diameter of insulating sheath in mm: 2.0 mm AWG26 (0.13 mm²) Outer diameter of insulating sheath in mm: 0.91 mm
Finished Dimensions	6.8 dia. mm
Internal Configuration and Lead Colors	
Yaskawa Standard Specifications (Standard Length)	Cable length: 30 m, 40 m, 50 m

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP19-30-E (30 m)

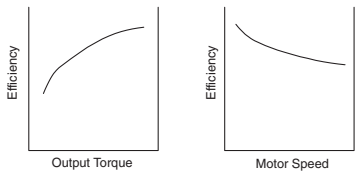
With Low-backlash Gears | Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Gear Mechanism: Planetary gear mechanism

Thermal Class: F
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP44
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 3 minutes max.
Gear Lubricating Method: Grease

Servomotor Model SGMSS-	Servomotors			Gears					Moment of Inertia ×10^{-4} kg·m^2	
	Output kW	Rated Speed min^{-1}	Rated Torque N·m	Gear Ratio	Rated Torque/ Efficiency *2 N·m/%	Instantaneous Peak Torque N·m/%	Rated Speed min^{-1}	Max. Speed*1 min^{-1}	Motors + Gears	Gears
10A□AL14	1.0	3000	3.18	1/5	12.7/80	38.2/80	600	800	5.18	3.44
10A□AL24				1/9	22.9/80	68.7/80	333	444	4.85	3.11
10A□AL54				1/20	50.9/80	153/80	150	200	8.53	6.79
10A□AL74				1/29	73.8/80	221/80	103	138	6.62	4.88
10A□AL84				1/45	115/80	343/80	66	89	5.66	3.92
15A□AL14	1.5	3000	4.9	1/5	19.6/80	58.8/80	600	800	5.44	3.44
15A□AL24				1/9	35.3/80	106/80	333	444	6.77	4.77
15A□AL54				1/20	78.4/80	235/80	150	200	8.79	6.79
15A□AL74				1/29	114/80	341/80	103	138	6.88	4.88
15A□AL84				1/45	176/80	529/80	66	89	8.58	6.58
20A□AL14	2.0	3000	6.36	1/5	25.6/80	76.4/80	600	800	5.91	3.44
20A□AL24				1/9	46/80	138/80	333	444	7.24	4.77
20A□AL54				1/20	102/80	306/80	150	200	9.26	6.79
20A□AL74				1/29	148/80	443/80	103	138	12.77	10.3
20A□AL84				1/45	230/80	688/80	66	89	9.05	6.58
25A□AL14	2.5	3000	7.96	1/5	31.8/80	95.5/80	600	800	11.04	7.85
25A□AL24				1/9	57.3/80	172/80	333	444	7.96	4.77
25A□AL54				1/20	127/80	382/80	150	200	18.19	15.0
25A□AL74				1/29	185/80	554/80	103	138	13.49	10.3
25A□AL84				1/45	287/80	860/80	66	89	9.77	6.58
30A□AL14	3.0	3000	9.8	1/5	39.2/80	118/80	600	800	17.2	10.2
30A□AL24				1/9	70.5/80	212/80	333	444	14.8	7.80
30A□AL54				1/20	157/80	470/80	150	200	27.2	20.2
30A□AL74				1/29	227/80	682/80	103	138	20.4	13.4
30A□AL84				1/45	353/80	1058/80	66	89	16.7	9.70
40A□AL14	4.0	3000	12.6	1/5	50.4/80	151/80	600	800	19.8	10.2
40A□AL24				1/9	90.7/80	272/80	333	444	22.1	12.5
40A□AL54				1/20	202/80	605/80	150	200	29.8	20.2
40A□AL74				1/29	292/80	877/80	103	138	23.0	13.4
50A□AL14	5.0	3000	15.8	1/5	63.2/80	190/80	600	800	32.7	20.4
50A□AL24				1/9	114/80	343/80	333	444	24.8	12.5
50A□AL54				1/20	253/80	762/80	150	200	32.5	20.2

*1: The maximum input motor speed of the gears is 4000 min^{-1}.
*2: Output torque and motor speed produce the following trends in efficiency. Values in the table are at the rated motor speed.



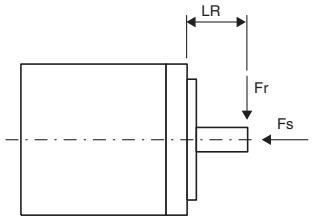
Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

With Low-backlash Gears | Ratings and Specifications

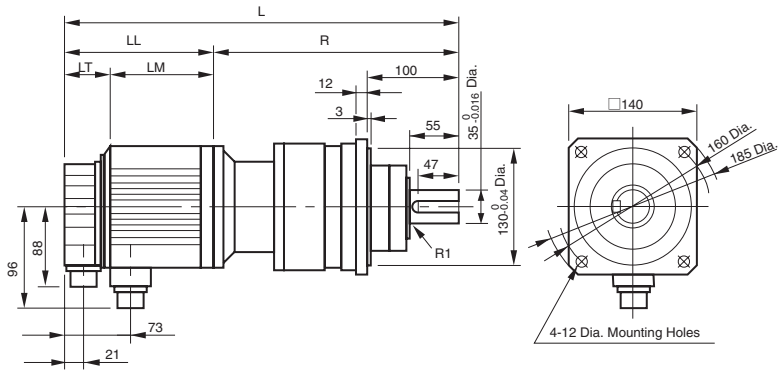
● Allowable Radial and Thrust Loads

Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

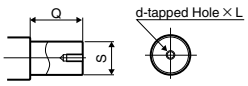
Servomotor Model SGMSS-	Servomotors with Low-backlash Gears			Reference Diagram
	Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	
10A□AL1□	833	0	72.5	
	0	1280	—	
10A□AL2□	980	0	72.5	
	0	1570	—	
10A□AL5□	2650	0	102.5	
	0	4220	—	
10A□AL7□	2940	0	102.5	
	0	4900	—	
10A□AL8□	3430	0	102.5	
	0	5690	—	
15A□AL1□	833	0	72.5	
	0	1280	—	
15A□AL2□	1960	0	102.5	
	0	3000	—	
15A□AL5□	2650	0	102.5	
	0	4220	—	
15A□AL7□	2940	0	102.5	
	0	4900	—	
15A□AL8□	8040	0	115	
	0	8830	—	
20A□AL1□	833	0	72.5	
	0	1280	—	
20A□AL2□	1960	0	102.5	
	0	3000	—	
20A□AL5□	2650	0	102.5	
	0	4220	—	
20A□AL7□	6860	0	115	
	0	7350	—	
20A□AL8□	8040	0	115	
	0	8830	—	
25A□AL1□	1670	0	102.5	
	0	1960	—	
25A□AL2□	1960	0	102.5	
	0	3000	—	
25A□AL5□	6080	0	115	
	0	6370	—	
25A□AL7□	6860	0	115	
	0	7350	—	
25A□AL8□	8040	0	115	
	0	8830	—	
30A□AL1□	1670	0	102.5	
	0	1960	—	
30A□AL2□	1960	0	102.5	
	0	3000	—	
30A□AL5□	6080	0	115	
	0	6370	—	
30A□AL7□	6860	0	115	
	0	7350	—	
30A□AL8□	8040	0	115	
	0	8830	—	
40A□AL1□	1670	0	102.5	
	0	1960	—	
40A□AL2□	4700	0	115	
	0	4320	—	
40A□AL5□	6080	0	115	
	0	6370	—	
40A□AL7□	6860	0	115	
	0	7350	—	
50A□AL1□	3820	0	115	
	0	2940	—	
50A□AL2□	4700	0	115	
	0	4320	—	
50A□AL5□	6080	0	115	
	0	6370	—	



● Small Grease Lubricating Type

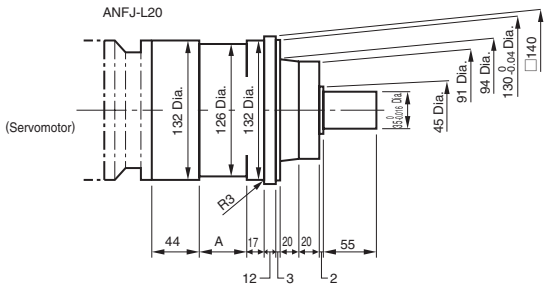


● Applied Specifications for Shaft-end Tap

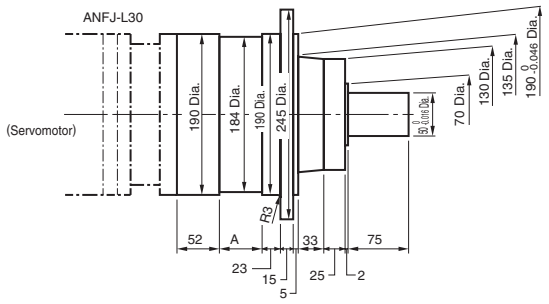


Frame No.	Dia. S	Length Q	d×L mm
ANFJ-L20	35	55	M8×16
ANFJ-L30	50	75	M10×20
ANFJ-L40	60	90	M12×24

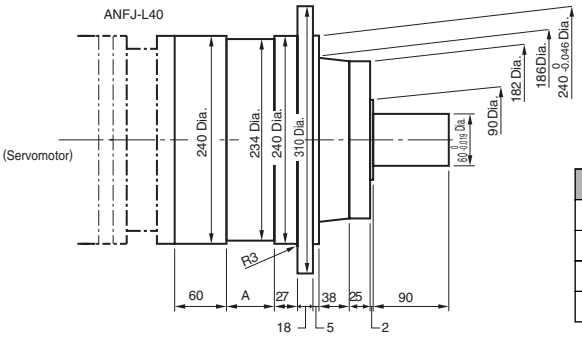
● Detailed Dimensions of IMT Gears



Gear Ratio	A
1/5	6
1/9	18
1/20, 1/29	37
1/45	47



Gear Ratio	A
1/5	11
1/9	38
1/20, 1/29	42
1/45	52



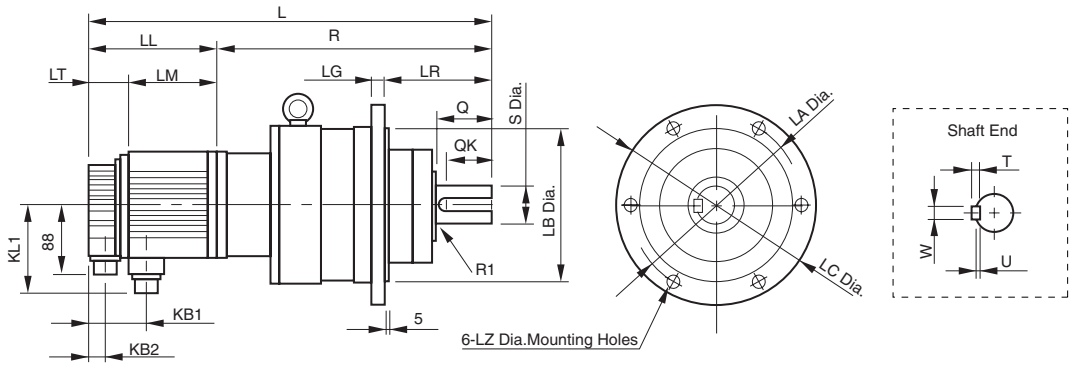
Gear Ratio	A
1/5	16
1/9	48
1/20, 1/29	48
1/45	58

Model SGMSS-	Gear Model No.	Gear Ratio	L	LL	LM	LT	R	Approx. Mass kg
10A□AL141	ANFJ-L20	1/5	403	149	103	46	254	13
10A□AL241		1/9	415	149	103	46	266	13
15A□AL141		1/5	414	160	116	44	254	14
20A□AL141		1/5	429	175	131	44	254	15

Note: Since grease has been filled prior to shipment, the servomotor can be used without replenishing grease.

With Low-backlash Gears | External Dimensions Units: mm

● Large Grease Lubricating Type



Model SGMSS-	Gear Model No.	Gear Ratio	L	LL	LM	LR	LT	KB1	KB2	KL1	R	Flange Face Dimensions					Shaft-end Dimensions						Approx. Mass kg
												LA	LB	LC	LG	LZ	Q	QK	S	T	U	W	
10A□AL541	ANFJ-L30	1/20	496	149	103	140	46	73	21	96	347	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	30
10A□AL741		1/29	496	149	103	140	46	73	21	96	347	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	30
10A□AL841		1/45	506	149	103	140	46	73	21	96	357	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	30
15A□AL241		1/9	503	160	116	140	44	73	21	96	343	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	30.3
15A□AL541		1/20	507	160	116	140	44	73	21	96	347	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	30.3
15A□AL741		1/29	507	160	116	140	44	73	21	96	347	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	30.3
15A□AL841	ANFJ-L40	1/45	558	160	116	160	44	73	21	96	398	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	50.1
20A□AL241	ANFJ-L30	1/9	518	175	131	140	44	73	21	96	343	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	30.8
20A□AL541		1/20	522	175	131	140	44	73	21	96	347	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	30.8
20A□AL741	ANFJ-L40	1/29	563	175	131	160	44	73	21	96	388	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	50.8
20A□AL841		1/45	573	175	131	160	44	73	21	96	398	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	51.3
25A□AL141	ANFJ-L30	1/5	520	204	154	140	50	79	21	96	316	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	25
25A□AL241		1/9	547	204	154	140	50	79	21	96	343	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	32
25A□AL541	ANFJ-L40	1/20	592	204	154	160	50	79	21	96	388	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	52
25A□AL741		1/29	592	204	154	160	50	79	21	96	388	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	52
25A□AL841		1/45	602	204	154	160	50	79	21	96	398	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	52.5
30A□AL141	ANFJ-L30	1/5	540	199	155	140	44	75	21	114	341	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	29
30A□AL241		1/9	567	199	155	140	44	75	21	114	368	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	36
30A□AL541	ANFJ-L40	1/20	612	199	155	160	44	75	21	114	413	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	56
30A□AL741		1/29	612	199	155	160	44	75	21	114	413	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	56
30A□AL841		1/45	622	199	155	160	44	75	21	114	423	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	56
40A□AL141	ANFJ-L30	1/5	577	236	192	140	44	75	21	114	341	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	32
40A□AL241	ANFJ-L40	1/9	649	236	192	160	44	75	21	114	413	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	59
40A□AL541		1/20	649	236	192	160	44	75	21	114	413	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	59
40A□AL741		1/29	649	236	192	160	44	75	21	114	413	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	59
50A□AL141		1/5	657	276	232	160	44	75	21	114	381	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	52
50A□AL241		1/9	689	276	232	160	44	75	21	114	413	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	62
50A□AL541		1/20	689	276	232	160	44	75	21	114	413	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	62

Note: Since grease has been filled prior to shipment, the servomotor can be used without replenishing grease.

Servomotors

SGMGH

(1500 min^{-1})

Model Designation

● Without Gears

SGMGH - 05 A 2 A 2 1

1st+2nd digits | 3rd digit | 4th digit | 5th digit | 6th digit | 7th digit

1st + 2nd digits Rated Output

Code	Specifications	Code	Specifications
05	450 W	30	2.9 kW
09	850 W	44	4.4 kW
13	1.3 kW	55	5.5 kW
20	1.8 kW	75	7.5 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)*
C	17-bit incremental encoder (standard)*

*: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
A	Standard
C	For high-performance machine tool*

*: Applicable only for models SGMGH-05 to -44.

6th digit Shaft End

Code	Specifications
2	Straight without key (standard)
3	Taper 1/10, with parallel key (optional)
5	Taper 1/10, with woodruff key (optional)*
6	Straight with key and tap (optional)

*: Applicable only for models SGMGH-05 and -09.

7th digit Brake and Oil Seal

Code	Specifications
1	Without brake
B	With 90-VDC brake
C	With 24-VDC brake
D	With oil seal and 90-VDC brake
E	With oil seal and 24-VDC brake
S	With oil seal

Features

- High-speed driving of feed shafts for various machines
- Wide selection: 450 W to 7.5 kW capacity, brake and gear options
- Model for high-performance machine tools: Optional
- Mounted encoder: 17-bit, high resolution
- Standard protection level: IP67

Application Examples

- Machine tools
- Transfer machines
- Material handling machines
- Food processing equipment

●With Gears

SGMGH - 05 A 2 A L 1 4 1

(1st+2nd digits) (3rd digit) (4th digit) (5th digit) (6th digit) (7th digit) (8th digit) (9th digit)

1st + 2nd digits Rated Output

Code	Specifications	Code	Specifications
05	450 W	30	2.9 kW
09	850 W	44	4.4 kW
13	1.3 kW	55	5.5 kW
20	1.8 kW	75	7.5 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC (With low-backlash gear)
P	200 VAC (With standard backlash gear)

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)*
C	17-bit incremental encoder (standard)*

*: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
A	Standard
C	For high-performance machine tool*

*: Applicable only for models SGMGH-05 to -44.

6th digit Gears

Code	Specifications
L	Low-backlash gear (Flange-mounted type)
E	Standard backlash gear (Foot-mounted type)
F	Standard backlash gear (Flange-mounted type)

7th digit Gear Ratio ○ : Available

・Low-backlash gear (Flange-mounted type)

Code	Gear Ratio	SGMGH-□					
		05	09	13	20	30	44
1	1/5	○	○	○	○	○	○
2	1/9	○	○	○	○	○	○
5	1/20	○	○	○	○	○	
7	1/29	○	○	○	○		
8	1/45	○	○	○			

・Standard backlash gear*

Code	Gear Ratio	SGMGH-□							
		05	09	13	20	30	44	55	75
A	1/6	○	○	○	○	○	○	○	
B	1/11	○	○	○	○	○	○	○	○
C	1/21	○	○	○	○	○	○	○	○
7	1/29	○	○	○	○	○	○	○	○

*: Foot-mounted and flange-mounted types are available.

8th digit Shaft End

Code	Specifications
4	Straight with key (Available only for SGMGH with low-backlash gear)
6	Straight with key and tap (Available only for SGMGH with standard-backlash gear)

9th digit Brakes

Code	Specifications
1	Without brake
B	With 90-VDC brake
C	With 24-VDC brake

Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Thermal Class: F
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP67 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

Voltage		200 V							
Servomotor Model: SGMGH-□□□□□		05A□A	09A□A	13A□A	20A□A	30A□A	44A□A	55A□A	75A□A
Rated Output*1	kW	0.45	0.85	1.3	1.8	2.9	4.4	5.5	7.5
Rated Torque*1	N·m	2.84	5.39	8.34	11.5	18.6 (14.8)*3	28.4	35.0	48.0
Instantaneous Peak Torque*1	N·m	8.92	13.8	23.3	28.7	45.1	71.1	87.6	119
Rated Current*1	Arms	3.8	7.1	10.7	16.7	23.8 (18.9)*3	32.8	42.1	54.7
Instantaneous Max. Current*1	Arms	11	17	28	42	56	84	110	130
Rated Speed*1	min^{-1}	1500							
Max. Speed*1	min^{-1}	3000							
Torque Constant	N·m/Arms	0.82	0.83	0.84	0.73	0.83	0.91	0.88	0.93
Rotor Moment of Inertia*2	$kg·m^2×10^{-4}$	7.24 (9.34)	13.9 (16.0)	20.5 (22.6)	31.7 (40.2)	46.0 (54.5)	67.5 (76.0)	89.0 (97.5)	125 (133.5)
Rated Power Rate*1	kW/s	11.2	20.9	33.8	41.5	75.3	120	137	184
Rated Angular Acceleration*1	rad/s^2	3930	3880	4060	3620	4050	4210	3930	3850

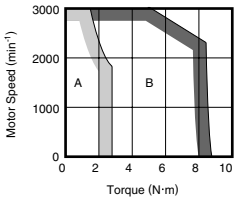
*1: These items and torque-motor speed characteristics quoted in combination with an SGDS SERVOPACK are at an armature winding temperature of 20℃.
*2: The values in the parentheses are those for motors with holding brakes.
*3: If using the SGMGH-30A□A servomotor and the SGDS-30 SERVOPACK together, take into consideration of the rated value in the parentheses.
Note: These characteristics are values with the following iron plate (heat sink) attached for cooling.
SGMGH-05, 09, 13: 400×400×22 (mm)
SGMGH-20, 30, 44, 55, 75: 550×550×30 (mm)

Ratings and Specifications

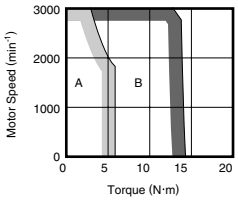
● Torque-motor Speed Characteristics

A Continuous Duty Zone B Intermittent Duty Zone

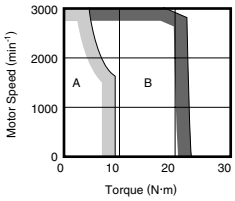
SGMGH-05A□A



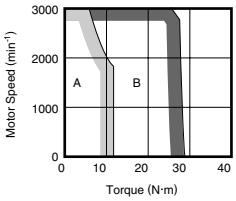
SGMGH-09A□A



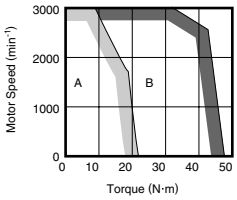
SGMGH-13A□A



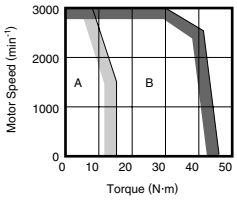
SGMGH-20A□A



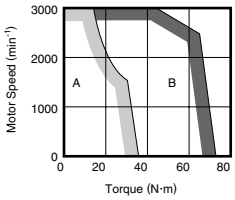
SGMGH-30A□A
(In combination with SGDS-50A SERVOPACK)



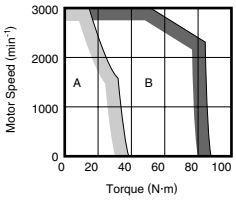
SGMGH-30A□A
(In combination with SGDS-30A SERVOPACK)



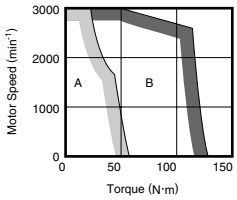
SGMGH-44A□A



SGMGH-55A□A



SGMGH-75A□A



● Holding Brake Electrical Specifications

Holding Brake Rated Voltage	Servomotor Model	Servomotor Capacity W	Holding Brake Specifications			
			Capacity W	Holding Torque N·m	Coil Resistance Ω (at 20℃)	Rated Current A (at 20℃)
90 VDC	SGMGH-05	450	10.1	4.41	804	0.11
	SGMGH-09	850	10.1	12.7	804	0.11
	SGMGH-13	1300	10.1	12.7	804	0.11
	SGMGH-20	1800	18.5	43.1	438	0.21
	SGMGH-30	2900	18.5	43.1	438	0.21
	SGMGH-44	4400	18.5	43.1	438	0.21
	SGMGH-55	5500	23.5	72.6	327	0.28
	SGMGH-75	7500	23.5	72.6	327	0.28
24 VDC	SGMGH-05	450	9.85	4.41	58.7	0.41
	SGMGH-09	850	9.85	12.7	58.7	0.41
	SGMGH-13	1300	9.85	12.7	58.7	0.41
	SGMGH-20	1800	18.5	43.1	31.1	0.77
	SGMGH-30	2900	18.5	43.1	31.1	0.77
	SGMGH-44	4400	18.5	43.1	31.1	0.77
	SGMGH-55	5500	23.5	72.6	24.5	0.98
	SGMGH-75	7500	23.5	72.6	24.5	0.98

Note: The holding brake is only used to hold the load and cannot be used to stop the servomotor.

● Allowable Load Moment of Inertia at the Motor Shaft

The rotor moment of inertia ratio is the value for a servomotor without a gear and a brake.

Servomotor Model	Capacity Range	Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)
SGMGH (1500 min^{-1})	450 W to 7.5 kW	×5*

*: The allowable load moment of inertia will be three times when the SGMGH-30A□A servomotor and the SGDS-30 SERVOPACK are used together.

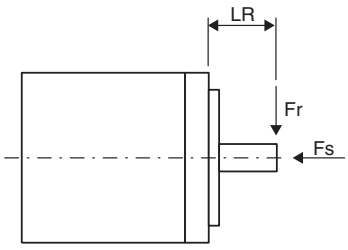
● Load Moment of Inertia

The larger the load moment of inertia, the worse the movement response of the load.
The size of the load moment of inertia (J_L) allowable when using a servomotor depends on motor capacity and is limited to within 5 to 30 times the moment of inertia of each servomotor (J_M). This value is provided strictly as a guideline and results may vary depending on servomotor drive conditions.
An overvoltage alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a regeneration overload alarm (A.320). Take one of the following steps if this occurs.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared. Contact your Yaskawa Application Engineering Department.

● Allowable Radial and Thrust Loads

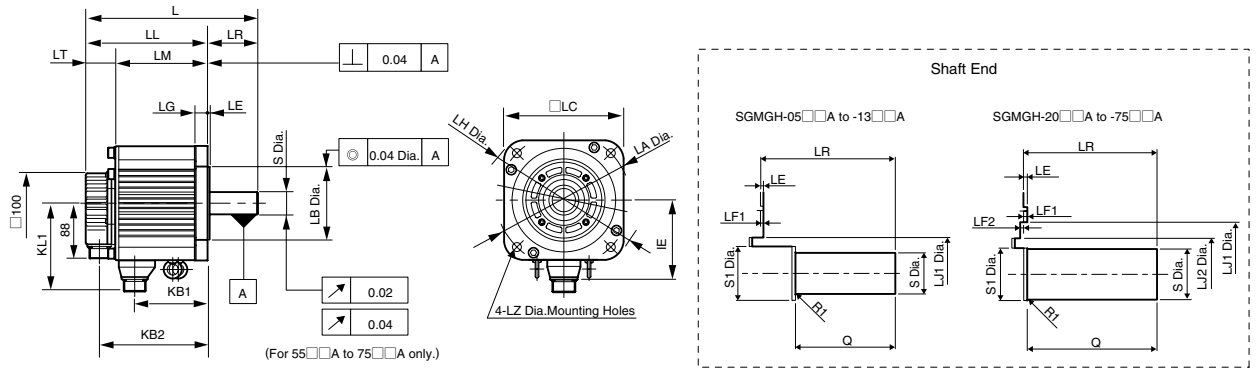
Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model		Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
SGMGH- (1500 min^{-1})	05A□A21	490	98	58	
	09A□A21	490	98	58	
	13A□A21	686	343	58	
	20A□A21	1176	490	79	
	30A□A21	1470	490	79	
	44A□A21	1470	490	79	
	55A□A21	1764	588	113	
	75A□A21	1764	588	113	

External Dimensions Units: mm

● Without Brakes

● 450 W to 7.5 kW



Note: For the specifications of the other shaft ends, refer to page 116.

Model SGMGH-	L	LL	LM	LR	LT	KB1	KB2	IE	KL1	Flange Face Dimensions											Shaft-end Dimensions			Approx. Mass kg
										LA	LB	LC	LE	LF1	LF2	LG	LH	LJ1	LJ2	LZ	S	S1	Q	
05A□A21	196	138	92	58	46	65	117	–	109	145	110 $^{0}_{-0.035}$	130	6	6	–	12	165	45	–	9	19 $^{0}_{-0.013}$	30	40	5.5
09A□A21	219	161	115	58	46	88	140	–	109	145	110 $^{0}_{-0.035}$	130	6	6	–	12	165	45	–	9	19 $^{0}_{-0.013}$	30	40	7.6
13A□A21	243	185	139	58	46	112	164	–	109	145	110 $^{0}_{-0.035}$	130	6	6	–	12	165	45	–	9	22 $^{0}_{-0.013}$	30	40	9.6
20A□A21	245	166	119	79	47	89	144	–	140	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	14
30A□A21	271	192	145	79	47	115	170	–	140	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	18
44A□A21	305	226	179	79	47	149	204	–	140	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	23
55A□A21	373	260	213	113	47	174	238	123	150	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	42 $^{0}_{-0.016}$	45	110	30
75A□A21	447	334	287	113	47	248	312	123	150	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	42 $^{0}_{-0.016}$	45	110	40

Note: Models with oil seals are of the same configuration.

● Connector Specifications for Encoder

(17-bit Encoder)

Receptacle: MS3102A20-29P
Applicable plug (To be provided by the customer)
Plug: MS3108B20-29S
Cable clamp: MS3057-12A

With an Absolute Encoder

A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA−	N	—
E	—	P	—
F	—	R	—
G	0V	S	BATT−
H	+5VDC	T	BATT+
J	FG (Frame ground)	—	—

With an Incremental Encoder

A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA−	N	—
E	—	P	—
F	—	R	—
G	0V	S	—
H	+5VDC	T	—
J	FG (Frame ground)	—	—

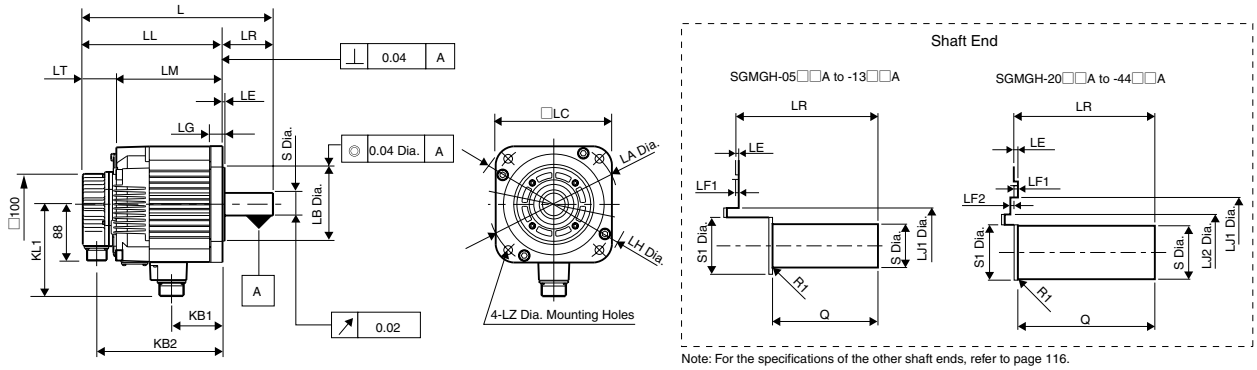
● Connector Specifications for Servomotor

A	Phase U
B	Phase V
C	Phase W
D	FG (Frame ground)

External Dimensions Units: mm

● With Brakes

(1) 450 W to 4.4 kW

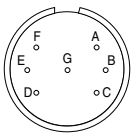


Note: For the specifications of the other shaft ends, refer to page 116.

Model SGMGH-	L	LL	LM	LR	LT	KB1	KB2	KL1	Flange Face Dimensions											Shaft-end Dimensions			Approx. Mass kg
									LA	LB	LC	LE	LF1	LF2	LG	LH	LJ1	LJ2	LZ	S	S1	Q	
05A□A2□	234	176	130	58	46	56	154	120	145	110 $^{0}_{-0.035}$	130	6	6	–	12	165	45	–	9	19 $^{0}_{-0.013}$	30	40	7.5
09A□A2□	257	199	153	58	46	79	177	120	145	110 $^{0}_{-0.035}$	130	6	6	–	12	165	45	–	9	19 $^{0}_{-0.013}$	30	40	9.6
13A□A2□	281	223	177	58	46	103	201	120	145	110 $^{0}_{-0.035}$	130	6	6	–	12	165	45	–	9	22 $^{0}_{-0.013}$	30	40	12
20A□A2□	296	217	169	79	48	79	195	146	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	19
30A□A2□	322	243	195	79	48	105	221	146	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	23.5
44A□A2□	356	277	229	79	48	139	255	146	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	28.5

Note: Models with oil seals are of the same configuration.

● Connector Specifications for Servomotor

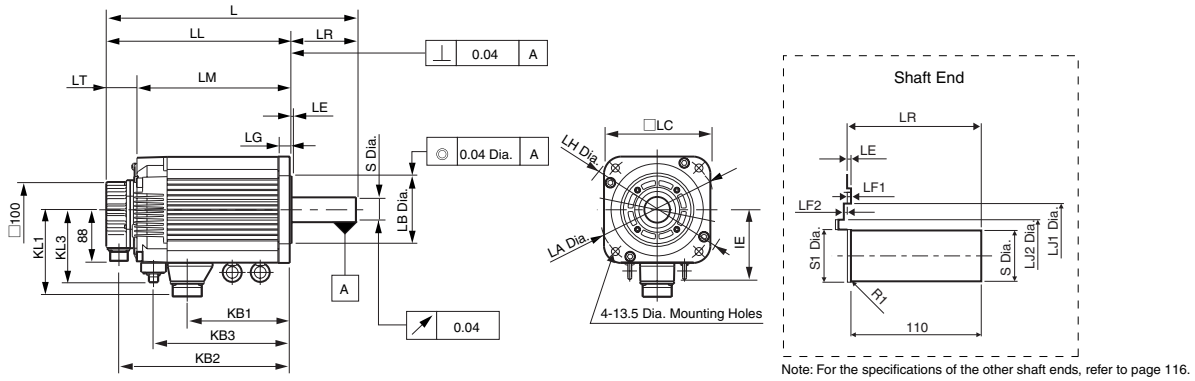


A	Phase U	E	Brake terminal
B	Phase V	F	Brake terminal
C	Phase W	G	—
D	FG (Frame ground)	—	—

Note: No polarity for connection to the brake terminals

External Dimensions Units: mm

(2) 5.5 kW to 7.5 kW

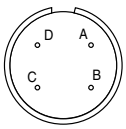


Note: For the specifications of the other shaft ends, refer to page 116.

Model SGMGH-	L	LL	LM	LR	LT	KB1	KB2	KB3	IE	KL1	KL3	Flange Face Dimensions										Shaft-end Dimensions		Approx. Mass kg
												LA	LB	LC	LE	LF1	LF2	LG	LH	LJ1	LJ2	S	S1	
55A□A2□	424	311	263	113	48	174	289	231	123	150	123	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	42 $^{0}_{-0.016}$	45	35
75A□A2□	498	385	337	113	48	248	363	305	123	150	123	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	42 $^{0}_{-0.016}$	45	45.5

Note: Models with oil seals are of the same configuration.

● Connector Specifications for Servomotor



A	Phase U
B	Phase V
C	Phase W
D	FG (Frame ground)

● Connector Specifications for Brake

A	Brake terminal
B	Brake terminal
C	—

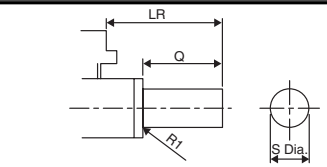
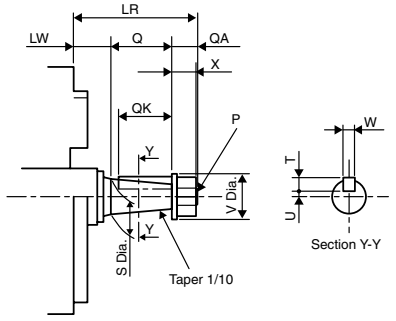
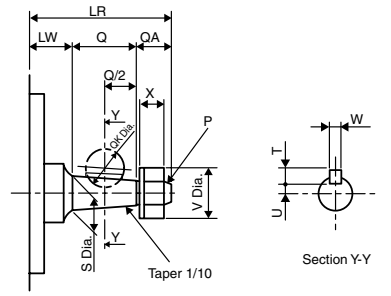
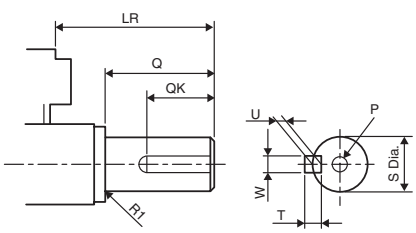
Note: No polarity for connection to the brake terminals

External Dimensions Units: mm

● Shaft End Specifications

SGMGH - □□□□□□□□

Symbol	Specifications	Remarks
2	Straight, without key	Standard
3	Taper 1/10, with parallel key (Key slot is JISB1301-1976 high precision. SGMGH series is interchangeable with USAGED series.)	Optional
5	Taper 1/10, woodruff key (Set only for SGMGH-05 and -09. Woodruff key is JISB1302.)	
6	Straight, with key and tap for one location (Key slot is JISB1301-1976 high precision. Key slot tolerance is JISB1301. Both key and tap are included.)	

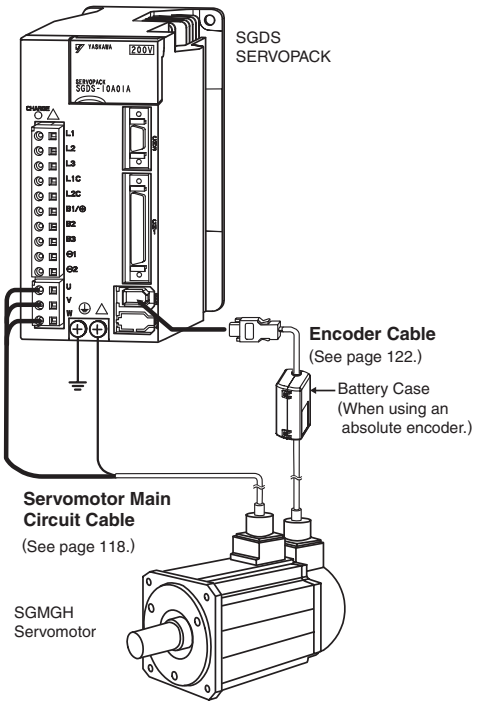
Symbol	Specifications	Shaft End		Model: SGMGH-							
				05A	09A	13A	20A	30A	44A	55A	75A
2	Straight, without key		LR	58			79			113	
			Q	40			76			110	
			S	19 $^{0}_{-0.013}$		22 $^{0}_{-0.013}$	35 $^{+0.01}_{0}$			42 $^{0}_{-0.016}$	
3	Taper 1/10, with parallel key		LR	58			102			132	
			LW	18			22				
			Q	28			58			82	
			QA	12			22			28	
			QK	25*1			50			70	
			X	10.3			19.2			23	
			S	16		19	32			42	
			V	21			37			44	
			P	M10, P1.25			M20, P1.5			M24, P2.0	
			W	5			7			10	
			T	5*2			7			8	
			U	4.3*3		5.8	10.55			13.95	
5	Taper 1/10, with woodruff key		LR	58		—	—			—	
			LW	18							
			Q	28							
			QA	12							
			QK	16							
			X	10.3							
			S	16							
			V	21							
			P	M10,P1.25							
			W	5							
			T	2							
			U	4.5							
6	Straight, with key and tap		LR	58			79			113	
			Q	40			76			110	
			QK	25			60			90	
			S	19 $^{0}_{-0.013}$		22 $^{0}_{-0.013}$	35 $^{+0.01}_{0}$			42 $^{0}_{-0.016}$	
			W	5		6	10			12	
			T	5		6	8				
			U	3		3.5	5				
			P	M5 screw, depth: 12			M12 screw, depth: 25			M16 screw, depth: 32	

*1: If the SGMGH-05A and 09A are not specified as the mounting interchangeable type, the value of the QK will be 16.
*2: If the SGMGH-05A and 09A are not specified as the mounting interchangeable type, the value of the T will be 2.
*3: If the SGMGH-05A and 09A are not specified as the mounting interchangeable type, the value of the U will be 4.5.

Selecting Cables

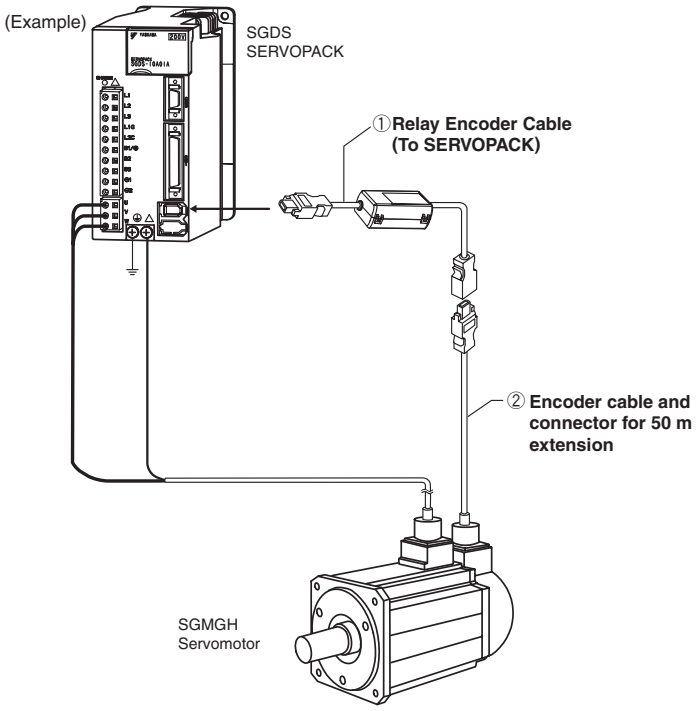
● Cable Connection

● For Standard Wiring



● For Encoder Cable Extensions from 30 m up to 50 m

(See page 124.)



> ⚠ CAUTION
>
> Separate the servomotor main circuit wiring from the I/O signal cable and encoder cable at least 30 cm, and do not bundle or run them in the same duct.

Selecting Cables

● Servomotor Main Circuit Cables

Customers must assemble the servomotor's main circuit cables and attach connectors to connect the SERVOPACKs and the SGMGH servomotors.

Use the connectors specified by Yaskawa when assembling the cable. Select the appropriate type of connector in accordance with the motor application. The following two types of connectors are available for SGMSS servomotors.

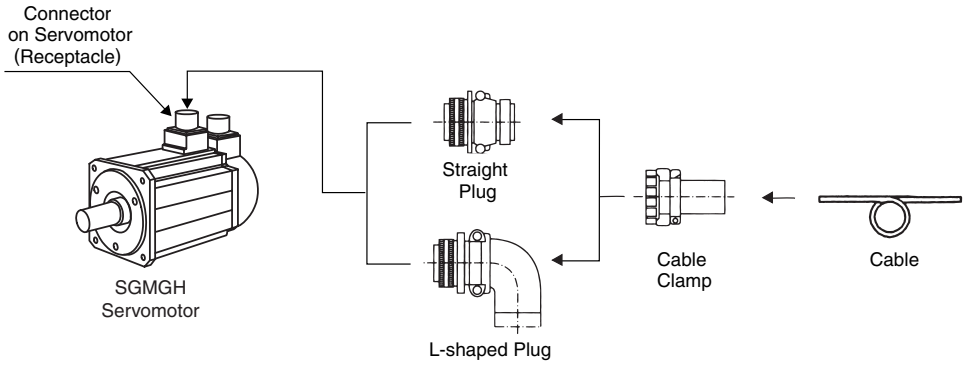
· Standard

· IP67 rated and compliant to European Safety standards

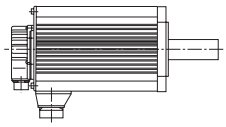
The cables have no restrictions. Use appropriate cables for the connectors.

● Connectors: Standard

● Connector Configuration

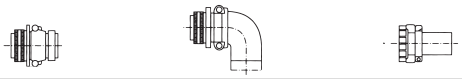


(1) Without Holding Brakes



For 0.45 kW to 7.5 kW

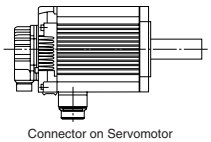
Connector on Servomotor
For 0.45 kW to 7.5 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor		
		Straight Plug	L-shaped Plug	Cable Clamp
0.45 0.85 1.3	MS3102A18-10P	MS3106B18-10S	MS3108B18-10S	MS3057-10A
1.8 2.9 4.4	MS3102A22-22P	MS3106B22-22S	MS3108B22-22S	MS3057-12A
5.5 7.5	MS3102A32-17P	MS3106B32-17S	MS3108B32-17S	MS3057-20A

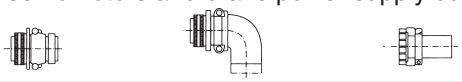
(2) With Holding Brakes

5.5 kW to 7.5 kW servomotors require cable connectors to servomotors and brake power supply connectors.

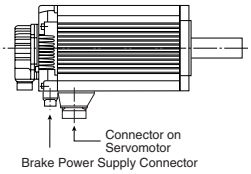


For 0.45 kW to 4.4 kW

Connector on Servomotor
For 0.45 kW to 7.5 kW

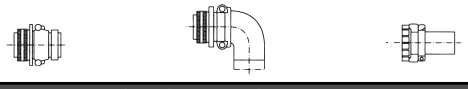


Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor		
		Straight Plug	L-shaped Plug	Cable Clamp
0.45 0.85 1.3	MS3102A20-15P	MS3106B20-15S	MS3108B20-15S	MS3057-12A
1.8 2.9 4.4	MS3102A24-10P	MS3106B24-10S	MS3108B24-10S	MS3057-16A
5.5 7.5	MS3102A32-17P	MS3106B32-17S	MS3108B32-17S	MS3057-20A



For 5.5 kW to 7.5 kW

Brake Power Supply Connector
(For 5.5 kW to 7.5 kW)

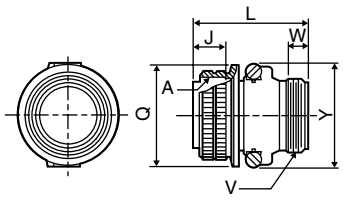


Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor		
		Straight Plug	L-shaped Plug	Cable Clamp
5.5 7.5	MS3102A10SL-3P	MS3106A10SL-3S	MS3108B10SL-3S	MS3057-4A

Selecting Cables Units: mm

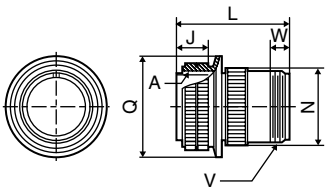
● Dimensional Drawings: Cable Connectors to Servomotors

(1) MS3106B□□-□□S: Straight Plug



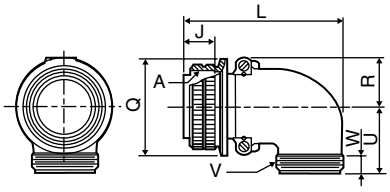
Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L max.	Outer Diameter of Joint Nut Q$^{+0}_{-0.38}$	Cable Clamp Set Screw V	Effective Screw Length W max.	Maxmum Width Y max.
18	1-1/8-18UNEF	18.26	52.37	34.13	1-20UNEF	9.53	42
20	1-1/4-18UNEF	18.26	55.57	37.28	1-3/16-18UNEF	9.53	47
22	1-3/8-18UNEF	18.26	55.57	40.48	1-3/16-18UNEF	9.53	50
24	1-1/2-18UNEF	18.26	58.72	43.63	1-7/16-18UNEF	9.53	53
32	2-18UNS	18.26	61.92	56.33	1-3/4-18UNS	11.13	66

(2) MS3106B10SL-3S: Straight Plug



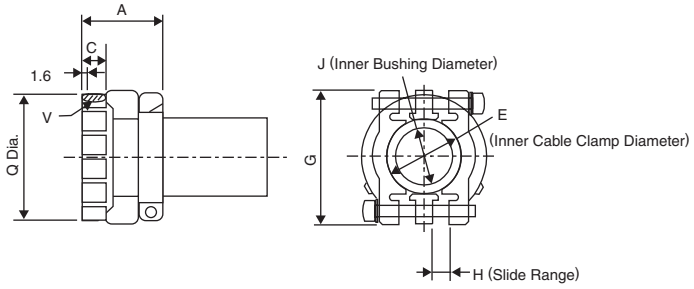
Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L max.	Outer Diameter of Joint Nut Q$^{+0}_{-0.38}$	Outer Diameter N±0.5	Cable Clamp Set Screw V	Effective Screw Length W max.
18	5/8-24UNEF	13.49	34.9	22.22	19.12	5/8-24UNEF	9.53

(3) MS3108B□□-□□S: L-shaped Plug



Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L max.	Outer Diameter of Joint Nut Q$^{+0}_{-0.38}$	R ±0.5	U ±0.5	Cable Clamp Set Screw V	Effective Screw Length W max.
18	1-1/8-18UNEF	18.26	68.27	34.13	20.5	30.2	1-20UNEF	9.53
20	1-1/4-18UNEF	18.26	76.98	37.28	22.5	33.3	1-3/16-18UNEF	9.53
22	1-3/8-18UNEF	18.26	76.98	40.48	24.1	33.3	1-3/16-18UNEF	9.53
24	1-1/2-18UNEF	18.26	86.51	43.63	25.6	36.5	1-7/16-18UNEF	9.53
32	2-18UNS	18.26	95.25	56.33	32.8	44.4	1-3/4-18UNS	11.13

(4) MS3057-□□A: Cable Clamp with Rubber Bushing

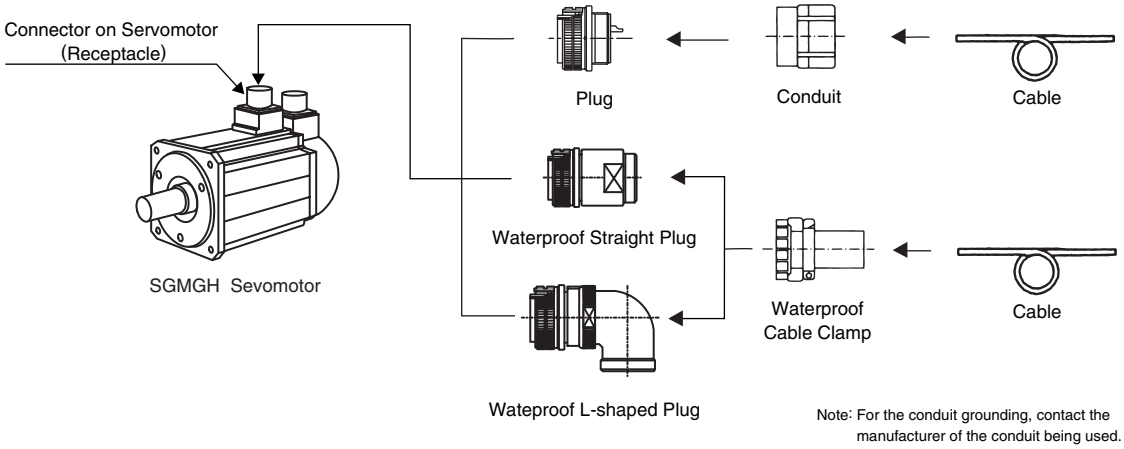


Cable Clamp Type	Applicable Connector Shell Size	Overall Length A±0.7	Effective Screw Length C	E	G±0.7	H	J	Set Screw V	Outer Diameter Q±0.7	Attached Bushing
MS3057-4A	10SL	20.6	10.3	7.9	22.2	1.6	5.6	5/8-24UNEF	20.6	AN3420-4
MS3057-10A	18	23.8	10.3	15.9	31.7	3.2	14.3	1-20UNEF	30.1	AN3420-10
MS3057-12A	20,22	23.8	10.3	19.0	37.3	4.0	15.9	1-3/16-18UNEF	35.0	AN3420-12
MS3057-16A	24	26.2	10.3	23.8	42.9	4.8	19.1	1-7/16-18UNEF	42.1	AN3420-16
MS3057-20A	32	27.8	11.9	31.7	51.6	6.3	23.8	1-3/4-18UNS	51.6	AN3420-20

Selecting Cables

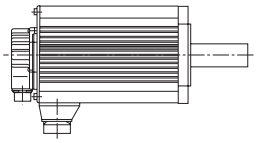
● Connectors: IP67 Rated and Compliant to European Safety Standards

● Connector Configuration



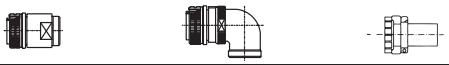
Note: For the conduit grounding, contact the manufacturer of the conduit being used.

(1) Without Holding Brakes



For 0.45 kW to 7.5 kW

Connector on Servomotor
For 0.45 kW to 4.4 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Straight Plug	L-shaped Plug	Cable Clamp	Applicable Cable Range (For Reference)	Manufacturer
0.45	CE05-2A18-10PD-B	CE05-6A18-10SD-B-BSS	CE05-8A18-10SD-B-BAS	CE3057-10A-1	10.5 to 14.1 dia.	DDK Ltd.
0.85				CE3057-10A-2	8.5 to 11.0 dia.	
1.3				CE3057-10A-3	6.5 to 8.7 dia.	
1.8	JL04HV-2E22-22PE-B	JL04V-6A22-22SE-EB or JA06A-22-22S-J1-EB	JL04V-8A22-22SE-EB or JA08A-22-22S-J1-EB	JL04-2022CK(09)	6.5 to 9.5 dia.	Japan Aviation Electronics Industry, Ltd.
2.9				JL04-2022CK(12)	9.5 to 13.0 dia.	
4.4				JL04-2022CK(14)	12.9 to 15.9 dia.	

Note: 1 Select a cable clamp in accordance with the applied cable diameter.
2 The straight plug (JA06A-22-22S-J1-EB) and the L-shaped plug (JA08A-22-22S-J1-EB) conform only to IP67 standards for environmental protection of enclosures.

Connector on Servomotor
For 5.5 kW to 7.5 kW

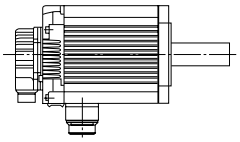
Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Plug	Straight Plug	L-shaped Plug	Applicable Cable Range (For Reference)	Manufacturer
5.5 7.5	JL04V-2E32-17PE-B	JL04V-6A32-17SE	ACS-16RL-MS32F	ACA-16RL-MS32F	12.0 to 16.0 dia.	Japan Aviation Electronics Industry, Ltd.
			ACS-20RL-MS32F	ACA-20RL-MS32F	16.0 to 20.0 dia.	
			ACS-24RL-MS32F	ACA-24RL-MS32F	20.0 to 24.0 dia.	
			ACS-28RL-MS32F	ACA-28RL-MS32F	24.0 to 28.0 dia.	
			ACS-32RL-MS32F	ACA-32RL-MS32F	28.0 to 32.0 dia.	
			ACS-36RL-MS32F	ACA-36RL-MS32F	32.0 to 36.0 dia.	

Note: Select a conduit in accordance with the applied cable diameter.

Selecting Cables

(2) With Holding Brakes

5.5 kW to 7.5 kW servomotors require cable connectors to servomotors and brake power supply connectors.



Connector on Servomotor

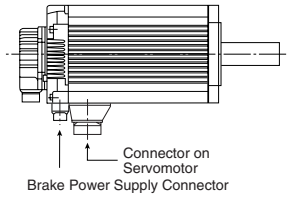
For 0.45 kW to 4.4 kW

Connector on Servomotor
For 0.45 kW to 4.4 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Straight Plug	L-shaped Plug	Cable Clamp	Applicable Cable Range (For Reference)	Manufacturer
0.45 0.85 1.3	JL04V-2E20- 15PE-B	JL04V-6A20-15SE-EB	JL04V-8A20-15SE-EB	JL04-2022CK(09)	6.5 to 9.5 dia.	Japan Aviation Electronics Industry, Ltd.
				JL04-2022CK(12)	9.5 to 13.0 dia.	
				JL04-2022CK(14)	12.9 to 15.9 dia.	
1.8 2.9 4.4	JL04V-2E24- 10PE-B	JL04V-6A24-10SE-EB or JA06A-24-10S-J1-EB	JL04V-8A24-10SE-EB or JA08A-24-10S-J1-EB	JL04-2428CK(11)	9.0 to 12.0 dia.	
				JL04-2428CK(14)	12.0 to 15.0 dia.	
				JL04-2428CK(17)	15.0 to 18.0 dia.	
				JL04-2428CK(20)	18.0 to 20.0 dia.	

Notes: 1 Select a cable clamp in accordance with the applied cable diameter.
2 The straight plug (JA06A-24-10S-J1-EB) and the L-shaped plug (JA08A-24-10S-J1-EB) conform only to IP67 standards for environmental protection of enclosures.



For 5.5 kW to 7.5 kW

Connector on Servomotor
For 5.5 kW to 7.5 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Plug	Straight Plug	L-shaped Plug	Applicable Cable Range (For Reference)	Manufacturer
5.5 7.5	JL04V-2E32-17PE-B	JL04V-6A32-17SE	ACS-16RL-MS32F	ACA-16RL-MS32F	12.0 to 16.0 dia.	Japan Aviation Electronics Industry, Ltd.
			ACS-20RL-MS32F	ACA-20RL-MS32F	16.0 to 20.0 dia.	
			ACS-24RL-MS32F	ACA-24RL-MS32F	20.0 to 24.0 dia.	
			ACS-28RL-MS32F	ACA-28RL-MS32F	24.0 to 28.0 dia.	
			ACS-32RL-MS32F	ACA-32RL-MS32F	28.0 to 32.0 dia.	
			ACS-36RL-MS32F	ACA-36RL-MS32F	32.0 to 36.0 dia.	

Note: Select a conduit in accordance with the applied cable diameter.

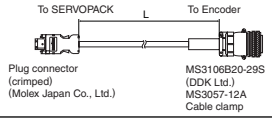
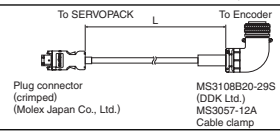
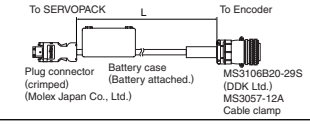
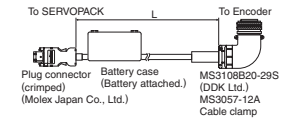
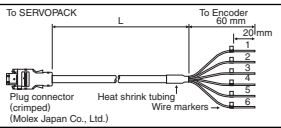
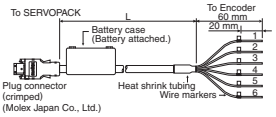
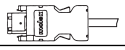
Brake Power Supply Connector
For 5.5 kW to 7.5 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Straight Plug	L-shaped Plug	Cable Clamp	Applicable Cable Range (For Reference)	Manufacturer
5.5 7.5	CE05-2A10SL- 3PC-B	CE05-6A10SL -3SC-B-BSS	CE05-8A10SL -3SC-B-BAS	CE3057-4A-1	3.6 to 5.6 dia.	DDK Ltd.

Selecting Cables

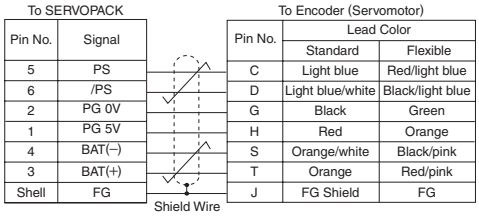
● Encoder Cables and Connectors (For Standard Wiring)

Name	Length (L)	Order No.		Specifications	Details
		Standard Cable	Flexible Cable*		
Encoder Cable with Connectors (For Incremental Encoder)	3 m	JZSP-CMP01-03-E	JZSP-CMP11-03-E		(1)
	5 m	JZSP-CMP01-05-E	JZSP-CMP11-05-E		
	10 m	JZSP-CMP01-10-E	JZSP-CMP11-10-E		
	15 m	JZSP-CMP01-15-E	JZSP-CMP11-15-E		
	20 m	JZSP-CMP01-20-E	JZSP-CMP11-20-E		
	3 m	JZSP-CMP02-03-E	JZSP-CMP12-03-E		
	5 m	JZSP-CMP02-05-E	JZSP-CMP12-05-E		
	10 m	JZSP-CMP02-10-E	JZSP-CMP12-10-E		
	15 m	JZSP-CMP02-15-E	JZSP-CMP12-15-E		
	20 m	JZSP-CMP02-20-E	JZSP-CMP12-20-E		
Encoder Cable with Connectors (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP06-03-E	JZSP-CSP26-03-E		(2)
	5 m	JZSP-CSP06-05-E	JZSP-CSP26-05-E		
	10 m	JZSP-CSP06-10-E	JZSP-CSP26-10-E		
	15 m	JZSP-CSP06-15-E	JZSP-CSP26-15-E		
	20 m	JZSP-CSP06-20-E	JZSP-CSP26-20-E		
	3 m	JZSP-CSP07-03-E	JZSP-CSP27-03-E		
	5 m	JZSP-CSP07-05-E	JZSP-CSP27-05-E		
	10 m	JZSP-CSP07-10-E	JZSP-CSP27-10-E		
	15 m	JZSP-CSP07-15-E	JZSP-CSP27-15-E		
	20 m	JZSP-CSP07-20-E	JZSP-CSP27-20-E		
Encoder Cable with Loose Wires to Encoder (For Incremental Encoder)	3 m	JZSP-CMP03-03-E	JZSP-CMP13-03-E		(3)
	5 m	JZSP-CMP03-05-E	JZSP-CMP13-05-E		
	10 m	JZSP-CMP03-10-E	JZSP-CMP13-10-E		
	15 m	JZSP-CMP03-15-E	JZSP-CMP13-15-E		
	20 m	JZSP-CMP03-20-E	JZSP-CMP13-20-E		
Encoder Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP04-03-E	JZSP-CSP24-03-E		(4)
	5 m	JZSP-CSP04-05-E	JZSP-CSP24-05-E		
	10 m	JZSP-CSP04-10-E	JZSP-CSP24-10-E		
	15 m	JZSP-CSP04-15-E	JZSP-CSP24-15-E		
	20 m	JZSP-CSP04-20-E	JZSP-CSP24-20-E		
Connector Kit to SERVOPACK		JZSP-CMP9-1-E		Soldered 	(5)
Connectors to Encoder for Standard (Connector on Servomotor: MS3102A20-29P)		MS3106B20-29S		Straight plug 	—
		MS3108B20-29S		L-shaped plug 	
		MS3057-12A		Cable clamp 	
Connectors to Encoder for IP67/European Safety Standards (Connector on Servomotor: 97F3102E20-29P)		JA06A-20-29S-J1-EB		Straight plug 	
		JA08A-20-29S-J1-EB		L-shaped plug 	
		JL04-2022CKE (09) Cable diameter: 6.5 to 9.5 mm		Cable clamp 	
		JL04-2022CKE (12) Cable diameter: 9.5 to 13 mm			
		JL04-2022CKE (14) Cable diameter: 12.9 to 15.9 mm			
Cables	5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	20 m max. 	(6)
	10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E		
	15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E		
	20 m	JZSP-CMP09-20-E	JZSP-CSP39-20-E		

*: Use flexible cables for movable sections such as robot arms.

Selecting Cables

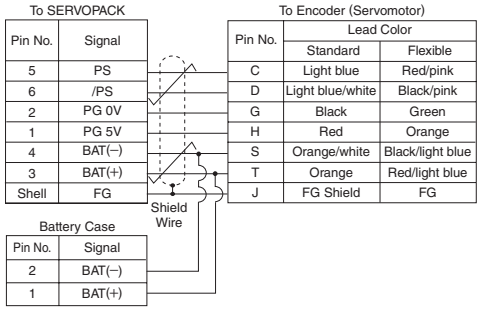
(1) Wiring for Cable with Connectors (For Incremental Encoder)



To SERVOPACK Pin No.	Signal	To Encoder (Servomotor) Pin No.	Lead Color Standard	Lead Color Flexible
5	PS	C	Light blue	Red/light blue
6	/PS	D	Light blue/white	Black/light blue
2	PG 0V	G	Black	Green
1	PG 5V	H	Red	Orange
4	BAT(–)	S	Orange/white	Black/pink
3	BAT(+)	T	Orange	Red/pink
Shell	FG	J	FG Shield	FG

Note: The signals BAT(+) and BAT(–) are used when using an absolute encoder.

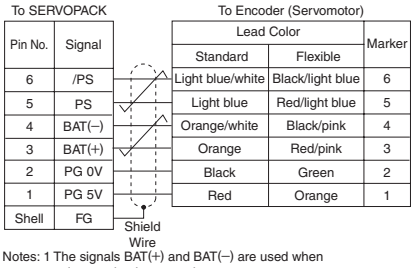
(2) Wiring for Cable with Connectors (For Absolute Encoder, with a Battery Case)



To SERVOPACK Pin No.	Signal	To Encoder (Servomotor) Pin No.	Lead Color Standard	Lead Color Flexible
5	PS	C	Light blue	Red/pink
6	/PS	D	Light blue/white	Black/pink
2	PG 0V	G	Black	Green
1	PG 5V	H	Red	Orange
4	BAT(–)	S	Orange/white	Black/light blue
3	BAT(+)	T	Orange	Red/light blue
Shell	FG	J	FG Shield	FG

Battery Case Pin No.	Signal
2	BAT(–)
1	BAT(+)

(3) Wiring for Cable with Loose Wires to Encoder (For Incremental Encoder)

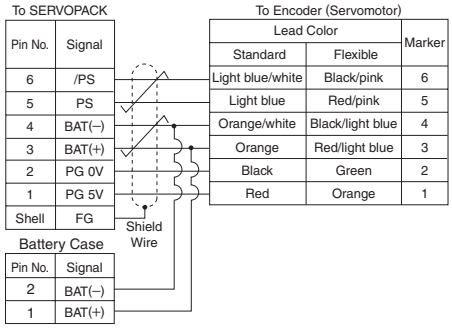


To SERVOPACK Pin No.	Signal	To Encoder (Servomotor) Lead Color Standard	Lead Color Flexible	Marker
6	/PS	Light blue/white	Black/light blue	6
5	PS	Light blue	Red/light blue	5
4	BAT(–)	Orange/white	Black/pink	4
3	BAT(+)	Orange	Red/pink	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

Notes: 1 The signals BAT(+) and BAT(–) are used when using an absolute encoder.

2 Be sure to connect the shield wire of encoder cable to the connector case (shell).

(4) Wiring for Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)

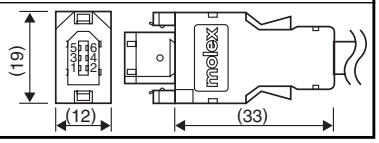


To SERVOPACK Pin No.	Signal	To Encoder (Servomotor) Lead Color Standard	Lead Color Flexible	Marker
6	/PS	Light blue/white	Black/pink	6
5	PS	Light blue	Red/pink	5
4	BAT(–)	Orange/white	Black/light blue	4
3	BAT(+)	Orange	Red/light blue	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

Battery Case Pin No.	Signal
2	BAT(–)
1	BAT(+)

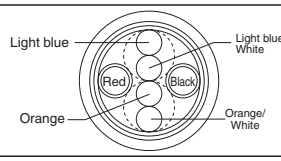
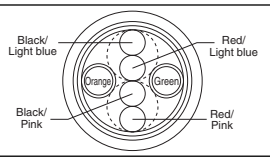
Note: Be sure to connect the shield wire of encoder cable to the connector case (shell).

(5) Connector Kits to SERVOPACK

Items	Specifications
Order No.	
Manufacturer	Molex Japan Co., Ltd.
Connector Model No. (For Standard)	55100-0670 (soldered)
Dimensional Drawings (Units: mm)	

Note: The mating connector model No. on SERVOPACK: 54280-0800

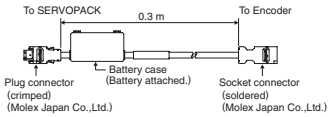
(6) Cables

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CMP09-□□-E	JZSP-CSP39-□□-E
Cable Length	20 m max.	
Specifications	UL20276 (Max. operating temperature: 80°C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.15 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.09 mm	UL20276 (Max. operating temperature: 80°C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.35 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.21 mm
Finished Dimensions	6.5 dia. mm	6.8 dia. mm
Internal Configuration and Lead Color		
Yaskawa Standards Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP09-05-E (5 m)

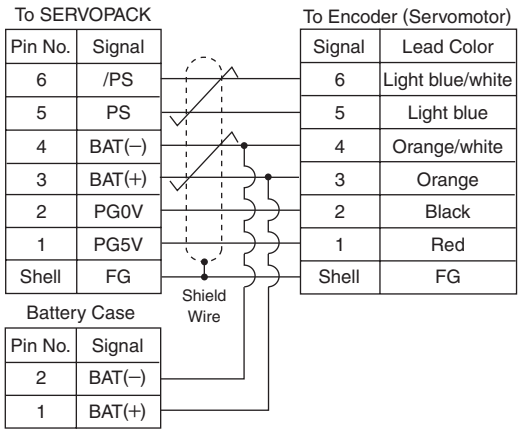
Selecting Cables

● Encoder Cables and Connectors (For Extending from 30 m up to 50 m)

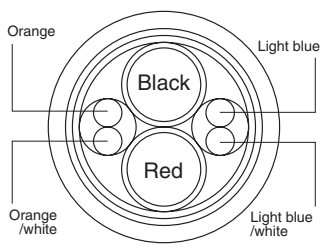
Name		Length	Order No.	Specifications	Details
① Relay Encoder Cable(for Relay)	For SERVOPACK (For Absolute Encoder, with a Battery Case)	0.3 m	JZSP-CSP12-E*		(1)
② Encoder cable and connector for 50 m extension	Connector to Encoder: Standard (Connector on Servomotor: MS3102A20-29P)		MS3106B20-29S	Straight plug 	—
			MS3108B20-29S	L-shaped plug 	
			MS3057-12A	Cable clamp 	
	Connector to Encoder: IP67/European Safety Standards (Connector on Servomotor: 97F3102E20-29P)		JA06A-20-29S-J1-EB	Straight plug 	
			JA08A-20-29S-J1-EB	L-shaped plug 	
			JL04-2022CKE (09) Cable diameter 6.5 to 9.5 mm	Cable clamp 	
			JL04-2022CKE (12) Cable diameter 9.5 to 13 mm		
			JL04-2022CKE (14) Cable diameter 12.9 to 15.9 mm		
	30 m to 50 m encoder cables are available	30 m	JZSP-CMP19-30-E	50 m max. 	(2)
		40 m	JZSP-CMP19-40-E		
		50 m	JZSP-CMP19-50-E		

*: Not required if using an incremental encoder or if using an absolute encoder with a battery connected to the host controller.

(1) Wiring for Relay Encoder Cable to SERVOPACK (For Absolute Encoder, with a Battery Case)



(2) Specification of 50 m encoder cable extension

Items	Standard Cable
Order No.*	JZSP-CMP19-□□-E
Cable Length	50 m max.
Specifications	UL20276 (Max. operating temperature: 80°C) AWG16×2C+AWG26×2P AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.0 mm AWG26 (0.13 mm²) Outer diameter of insulating sheath: 0.91 mm
Finished Dimensions	6.8 dia. mm
Internal Configuration and Lead Colors	
Yaskawa Standard Specifications (Standard Length)	Cable length: 30 m, 40 m, 50 m

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP19-30-E (30 m)

With Standard Backlash Gears | Ratings and Specifications

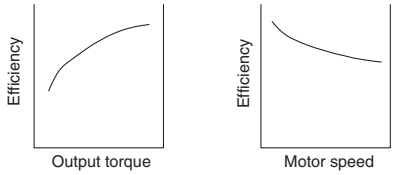
Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Foot and flange-mounted
Frame Nos. 6090 to 6125: Omni-directional mounting
Frame Nos. 6130 to 6190: Horizontal mounting to shaft
Gear Mechanism: Cyclo gear mechanism
Thermal Class: F

Withstand Voltage: 200 V Servomotors, 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP44 (or the equivalent)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: Roughly 0.6 to 2° at the gear output shaft
Gear Rotation Direction: Reverse direction of servomotor
Gear Lubricating Method: Frame Nos. 6090 to 6125: Grease
Frame Nos. 6130 to 6190: Oil

Note: Contact your Yaskawa representative for more information if the servomotors are to be used for applications with the following characteristics:
・Continuous or frequent stop/start
・Heavy shock loading by acceleration/deceleration

Servomotor Model SGMGH-	Servomotor			Gear Output					Moment of Inertia kg·m²×10⁻⁴	
	Output kW	Rated Speed min⁻¹	Rated Torque N·m	Gear Ratio	Rated Torque/ Efficiency* N·m/%	Instantaneous Peak Torque N·m/%	Rated Speed min⁻¹	Max. Speed min⁻¹	Motor + Gear	Gear
05P□A□A6	0.45	1500	2.84	1/6	12.8/75	40.1/75	250	500	9.20	1.96
05P□A□B6				1/11	25.0/80	78.5/80	136	272	8.84	1.6
05P□A□C6				1/21	47.7/80	150/80	71	142	8.39	1.15
05P□A□76				1/29	65.9/80	207/80	51	103	8.41	1.17
09P□A□A6	0.85		5.39	1/6	25.9/80	66.2/80	250	500	15.7	1.78
09P□A□B6				1/11	47.4/80	121/80	136	272	15.3	1.35
09P□A□C6				1/21	90.6/80	232/80	71	142	15.9	1.97
09P□A□76				1/29	125/80	320/80	51	103	16.1	2.19
13P□A□A6	1.3		8.34	1/6	40.0/80	112/80	250	500	22.3	1.84
13P□A□B6				1/11	73.4/80	205/80	136	272	23.4	2.89
13P□A□C6				1/21	140/80	391/85	71	142	22.5	2.03
13P□A□76				1/29	206/85	574/85	51	103	24.2	3.67
20P□A□A6	1.8		11.5	1/6	58.7/85	146/85	250	500	38.0	6.3
20P□A□B6				1/11	108/85	268/85	136	272	36.5	4.76
20P□A□C6				1/21	205/85	512/85	71	142	37.6	5.93
20P□A□76				1/29	283/85	707/85	51	103	37.3	5.58
30P□A□A6	2.9		18.6	1/6	94.9/85	230/85	250	500	52.3	6.3
30P□A□B6				1/11	174/85	422/85	136	272	50.8	4.76
30P□A□C6				1/21	332/85	805/85	71	142	51.9	5.93
30P□A□76				1/29	458/85	1110/85	51	103	78.5	32.5
44P□A□A6	4.4		28.4	1/6	145/85	363/85	250	500	79.5	12.0
44P□A□B6				1/11	266/85	665/85	136	272	75.2	7.73
44P□A□C6				1/21	507/85	1270/85	71	142	101	33.6
44P□A□76				1/29	700/85	1750/85	51	103	121	53.3
55P□A□A6	5.5		35.0	1/6	179/85	447/85	250	500	103	13.7
55P□A□B6				1/11	327/85	819/85	136	272	98.8	9.78
55P□A□C6				1/21	625/85	1560/85	71	142	157	68.0
55P□A□76				1/29	863/85	2160/85	51	103	155	66.0
75P□A□B6	7.5		48.0	1/11	449/85	1110/85	136	272	175	50.2
75P□A□C6				1/21	857/85	2120/85	71	142	193	68.0
75P□A□76				1/29	1180/85	2930/85	51	103	207	81.5

*: Output torque and motor speed produce the following trends in efficiency. Values in the table are at the rated motor speed.



Notes: 1 For oil lubrication, the motor should be mounted horizontal to the shaft. Contact your Yaskawa representative about lubrication for angle mounting.
2 The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

● Allowable Radial Load

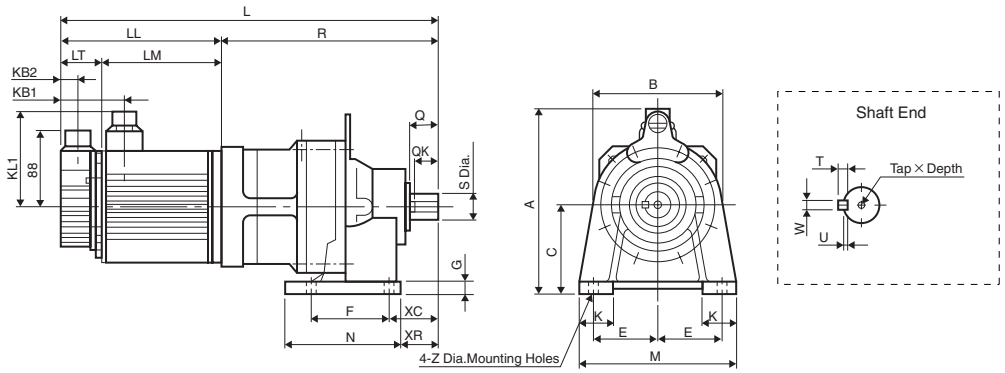
Servomotor Model SGMGH-		Allowable Radial Load for Shaft Center (Fr) N
Grease-lubricating Type ・With Foot ・Flange Type	05P□A□A6	2830
	05P□A□B6	3340
	05P□A□C6	5400
	05P□A□76	5400
	09P□A□A6	4110
	09P□A□B6	5220
	09P□A□C6	8240
	09P□A□76	8980
	13P□A□A6	4090
	13P□A□B6	6650
	13P□A□C6	8190
	20P□A□A6	5220
	20P□A□B6	6620
	30P□A□A6	5180
	30P□A□B6	6560

Servomotor Model SGMGH-		Allowable Radial Load for Shaft Center (Fr) N
Oil-lubricating Type ・With Foot ・Flange Type	13P□A□76	10500
	20P□A□C6	9510
	20P□A□76	10400
	30P□A□C6	13900
	30P□A□76	17900
	44P□A□A6	6030
	44P□A□B6	7660
	44P□A□C6	16300
	44P□A□76	20100
	55P□A□A6	5990
	55P□A□B6	11500
	55P□A□C6	18300
	55P□A□76	20000
	75P□A□B6	13100
	75P□A□C6	18200
	75P□A□76	26600

Foot-mounted Type with Standard Backlash Gears | External Dimensions Units: mm

- Without Brakes

(1) Grease Lubricating Type



Units: mm

Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	LT	KB1	KB2	KL1	R	A	B	C*
05P□AEA61	CNHX-6090	1/6	380	138	94	44	73	21	109	242	209	152	100
05P□AEB61	CNHX-6090	1/11	380	138	94	44	73	21	109	242	209	152	100
05P□AEC61	CNHX-6100	1/21	394	138	94	44	73	21	109	256	209	152	100
05P□AE761	CNHX-6100	1/29	394	138	94	44	73	21	109	256	209	152	100
09P□AEA61	CNHX-6100	1/6	417	161	117	44	73	21	109	256	209	152	100
09P□AEB61	CNHX-6100	1/11	417	161	117	44	73	21	109	256	209	152	100
09P□AEC61	CNHX-6120	1/21	449	161	117	44	73	21	109	288	257	204	120
09P□AE761	CNHX-6120	1/29	449	161	117	44	73	21	109	288	257	204	120
13P□AEA61	CNHX-6100	1/6	441	185	141	44	73	21	109	256	209	152	100
13P□AEB61	CNHX-6120	1/11	473	185	141	44	73	21	109	288	257	204	120
13P□AEC61	CNHX-6125	1/21	473	185	141	44	73	21	109	288	257	204	120
20P□AEA61	CNHX-6120	1/6	477	166	121	45	77	22	140	311	260	204	120
20P□AEB61	CNHX-6125	1/11	477	166	121	45	77	22	140	311	260	204	120
30P□AEA61	CNHX-6120	1/6	503	192	147	45	77	22	140	311	260	204	120
30P□AEB61	CNHX-6125	1/11	503	192	147	45	77	22	140	311	260	204	120

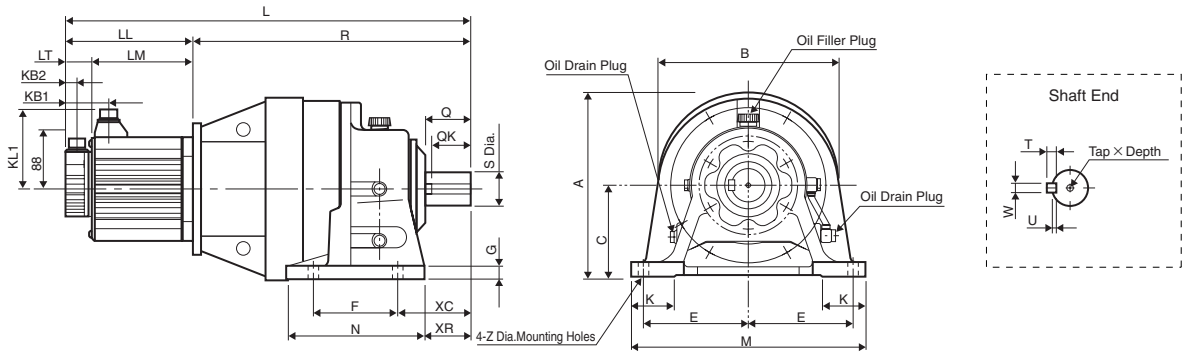
Model SGMGH-	Foot-mounted Dimensions									Shaft-end Dimensions							Approx. Mass kg
	E	F	G	K	M	N	XR	XC	Z	Q	QK	S	T	U	W	Tap × Depth	
05P□AEA61	75	90	12	65	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	20.7
05P□AEB61	75	90	12	65	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	20.7
05P□AEC61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	22.7
05P□AE761	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	22.7
09P□AEA61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	24.6
09P□AEB61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	24.6
09P□AEC61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	34.6
09P□AE761	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	34.6
13P□AEA61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	26.6
13P□AEB61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	36.6
13P□AEC61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	36.6
20P□AEA61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	43
20P□AEB61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	43
30P□AEA61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	47
30P□AEB61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	47

*: The tolerances for all models are 0 to -0.5.

Note: Grease lubricating type (frame numbers: 6090 to 6125)
Since grease has been filled prior to shipment, the servomotors can be used without replenishing grease.

● Without Brakes

(2) Oil Lubricating Type



Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	LT	KB1	KB2	KL1	R	A*1	B	C*2
13P□AE761	CHHX-6130	1/29	532	185	141	44	73	21	109	347	300	246	150
20P□AEC61	CHHX-6130	1/21	536	166	121	45	77	22	140	370	300	246	150
20P□AE761	CHHX-6135	1/29	536	166	121	45	77	22	140	370	300	246	150
30P□AEC61	CHHX-6140	1/21	582	192	147	45	77	22	140	390	300	246	150
30P□AE761	CHHJ-6160	1/29	687	192	147	45	77	22	140	495	367	318	160
44P□AEA61	CHHX-6130	1/6	596	226	181	45	77	22	140	370	300	246	150
44P□AEB61	CHHX-6135	1/11	596	226	181	45	77	22	140	370	300	246	150
44P□AEC61	CHHJ-6160	1/21	721	226	181	45	77	22	140	495	367	318	160
44P□AE761	CHHJ-6170	1/29	785	226	181	45	77	22	140	559	429	363	200
55P□AEA61	CHHX-6135	1/6	664	260	215	45	86	22	150	404	300	246	150
55P□AEB61	CHHX-6140	1/11	684	260	215	45	86	22	150	424	300	246	150
55P□AEC61	CHHJ-6170	1/21	853	260	215	45	86	22	150	593	429	363	200
55P□AE761	CHHJ-6175	1/29	853	260	215	45	86	22	150	593	429	363	200
75P□AEB61	CHHJ-6160	1/11	863	334	289	45	86	22	150	529	367	318	160
75P□AEC61	CHHJ-6175	1/21	927	334	289	45	86	22	150	593	429	363	200
75P□AE761	CHHJ-6180	1/29	977	334	289	45	86	22	150	643	467	393	220

Model SGMGH-	Foot-mounted Dimensions									Shaft-end Dimensions							Approx. Mass kg
	E	F	G	K	M	N	XR	XC	Z	Q	QK	S	T	U	W	Tap × Depth	
13P□AE761	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	57.6
20P□AEC61	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	67
20P□AE761	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	67
30P□AEC61	145	145	22	65	330	195	95	120	18	90	80	$50^{0}_{-0.016}$	9	5.5	14	M10×18	72
30P□AE761	185	150	25	75	410	238	95	139	18	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	126
44P□AEA61	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	76
44P□AEB61	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	76
44P□AEC61	185	150	25	75	410	238	95	139	18	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	131
44P□AE761	190	275	30	80	430	335	95	125	22	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	176
55P□AEA61	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	88
55P□AEB61	145	145	22	65	330	195	95	120	18	90	80	$50^{0}_{-0.016}$	9	5.5	14	M10×18	89
55P□AEC61	190	275	30	80	430	335	95	125	22	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	191
55P□AE761	190	275	30	80	430	335	95	125	22	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	191
75P□AEB61	185	150	25	75	410	238	95	139	18	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	155
75P□AEC61	190	275	30	80	430	335	95	125	22	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	201
75P□AE761	210	320	30	85	470	380	115	145	22	110	100	$80^{0}_{-0.019}$	14	9	22	M12×24	245

*1: Dimensions of hooks are included for some models.

*2: The tolerances for all models are 0 to -0.5.

Note: Oil lubricating type (frame numbers: 6130 to 6190)

Servomotors of this type have been shipped with oil removed. Be sure to add oil until the red line at the upper side of the oil guage.

Lubrication oil recommended is industrial-use extreme-pressure gear oil of SP-system, JIS K 2219 industrial-use gear oil or equivalent. Refer to the following table.

Surrounding Air Temperature	Manufacturer						
	COSMO Oil Co., Ltd.	Nippon Oil Co., Ltd.	Idemitsu Oil & Gas Co., Ltd.	Showa Shell Sekiyu K.K.	Exxon Mobil Corporation.		JAPAN ENERGY CORPORATION
0°C to 35°C	COSMO Gear SE 100, 150	BON-NOCK M 100, 150	Daphne Super Gear Oil 100, 150	Shell Omala Oil 100, 150	Spartan EP 100, 150	Mobil Gear 627, 629 (ISO VG100, 150)	JOMO Reductus 100,150

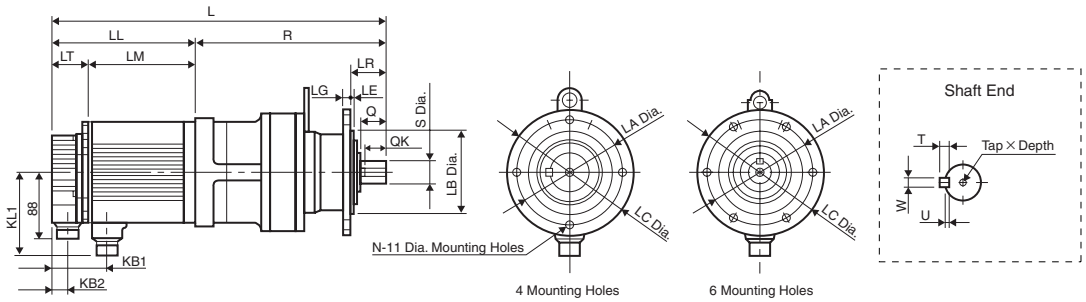
The following table shows the approximate amount of oil to be added. Units: liter

Frame No.	6130 6135	6140	6160	6170 6175	6180 6185	6190
Horizontal Type	0.7	0.7	1.4	1.9	2.5	4.0

Flange-mounted Type with Standard Backlash Gears | External Dimensions Units: mm

● Without Brakes

(1) Grease Lubricating Type



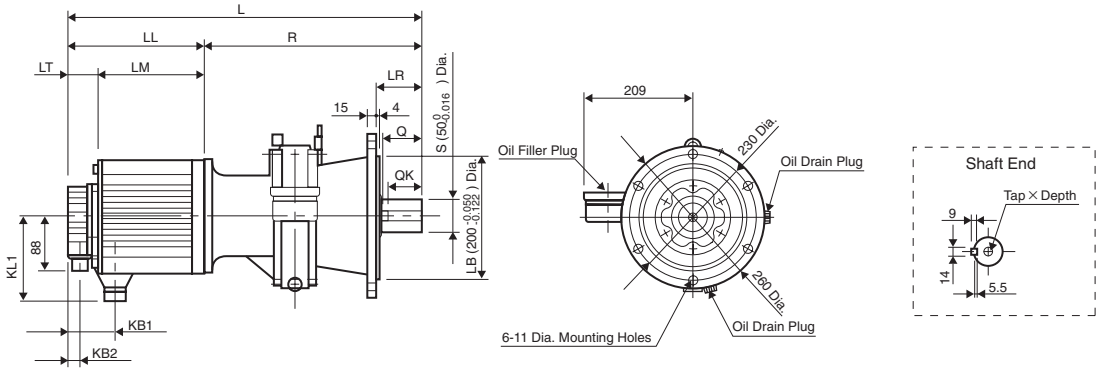
Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	LT	KB1	KB2	KL1	R
05P□AFA61	CNVX-6090	1/6	380	138	94	44	73	21	109	242
05P□AFB61	CNVX-6090	1/11	380	138	94	44	73	21	109	242
05P□AFC61	CNVX-6100	1/21	394	138	94	44	73	21	109	256
05P□AF761	CNVX-6100	1/29	394	138	94	44	73	21	109	256
09P□AFA61	CNVX-6100	1/6	417	161	117	44	73	21	109	256
09P□AFB61	CNVX-6100	1/11	417	161	117	44	73	21	109	256
09P□AFC61	CNVX-6120	1/21	449	161	117	44	73	21	109	288
09P□AF761	CNVX-6120	1/29	449	161	117	44	73	21	109	288
13P□AFA61	CNVX-6100	1/6	441	185	141	44	73	21	109	256
13P□AFB61	CNVX-6120	1/11	473	185	141	44	73	21	109	288
13P□AFC61	CNVX-6125	1/21	473	185	141	44	73	21	109	288
20P□AFA61	CNVX-6120	1/6	477	166	121	45	77	22	140	311
20P□AFB61	CNVX-6125	1/11	477	166	121	45	77	22	140	311
30P□AFA61	CNVX-6120	1/6	503	192	147	45	77	22	140	311
30P□AFB61	CNVX-6125	1/11	503	192	147	45	77	22	140	311

Model SGMGH-	Flange Face Dimensions										Shaft-end Dimensions				Approx. Mass kg
	LA	LB	LC	LE	LG	LR	N	Q	QK	S	T	U	W	Tap × Depth	
05P□AFA61	134	110 $^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	28 $^{0}_{-0.013}$	7	4	8	M8×20	18.7
05P□AFB61	134	110 $^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	28 $^{0}_{-0.013}$	7	4	8	M8×20	18.7
05P□AFC61	134	110 $^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	28 $^{0}_{-0.013}$	7	4	8	M8×20	20.7
05P□AF761	134	110 $^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	28 $^{0}_{-0.013}$	7	4	8	M8×20	20.7
09P□AFA61	134	110 $^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	28 $^{0}_{-0.013}$	7	4	8	M8×20	22.6
09P□AFB61	134	110 $^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	28 $^{0}_{-0.013}$	7	4	8	M8×20	22.6
09P□AFC61	180	140 $^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	38 $^{0}_{-0.016}$	8	5	10	M8×20	33.6
09P□AF761	180	140 $^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	38 $^{0}_{-0.016}$	8	5	10	M8×20	33.6
13P□AFA61	134	110 $^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	28 $^{0}_{-0.013}$	7	4	8	M8×20	24.6
13P□AFB61	180	140 $^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	38 $^{0}_{-0.016}$	8	5	10	M8×20	35.6
13P□AFC61	180	140 $^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	38 $^{0}_{-0.016}$	8	5	10	M8×20	35.6
20P□AFA61	180	140 $^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	38 $^{0}_{-0.016}$	8	5	10	M8×20	42
20P□AFB61	180	140 $^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	38 $^{0}_{-0.016}$	8	5	10	M8×20	42
30P□AFA61	180	140 $^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	38 $^{0}_{-0.016}$	8	5	10	M8×20	46
30P□AFB61	180	140 $^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	38 $^{0}_{-0.016}$	8	5	10	M8×20	46

Note: Grease lubricating type (frame numbers: 6090 to 6125)
Since grease has been filled prior to shipment, the servomotors can be used without replenishing grease.

● Without Brakes

(2) Small Oil Lubricating Type



Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	LT	KB1	KB2	KL1	R	Flange Face Dimensions	Shaft-end Dimensions			Approx. Mass kg
											LR	Q	QK	Tap × Depth	
13P□AF761	CHVX-6130	1/29	532	185	141	44	73	21	109	347	76	70	56	M10×18	56.6
20P□AFC61	CHVX-6130	1/21	536	166	121	45	77	22	140	370	76	70	56	M10×18	66
20P□AF761	CHVX-6135	1/29	536	166	121	45	77	22	140	370	76	70	56	M10×18	66
30P□AFC61	CHVX-6140	1/21	582	192	147	45	77	22	140	390	96	90	80	M10×18	71
44P□AFA61	CHVX-6130	1/6	596	226	181	45	77	22	140	370	76	70	56	M10×18	75
44P□AFB61	CHVX-6135	1/11	596	226	181	45	77	22	140	370	76	70	56	M10×18	75
55P□AFA61	CHVX-6135	1/6	664	260	215	45	86	22	150	404	76	70	56	M10×18	87
55P□AFB61	CHVX-6140	1/11	684	260	215	45	86	22	150	424	96	90	80	M10×18	88

Note: Oil lubricating type (frame numbers: 6130 to 6190)
Servomotors of this type have been shipped with oil removed. Be sure to add oil until the red line at the upper side of the oil guage.
Lubrication oil recommended is industrial-use extreme-pressure gear oil of SP-system, JIS K 2219 industrial-use gear oil or equivalent. Refer to the following table.

Surrounding Air Temperature	Manufacturer						
	COSMO Oil Co., Ltd.	Nippon Oil Co., Ltd.	Idemitsu Oil & Gas Co., Ltd.	Showa Shell Sekiyu K.K.	Exxon Mobil Corporation.		JAPAN ENERGY CORPORATION
0°C to 35°C	COSMO Gear SE 100, 150	BON-NOCK M 100, 150	Daphne Super Gear Oil 100, 150	Shell Omala Oil 100, 150	Spartan EP 100, 150	Mobil Gear 627, 629 (ISO VG100, 150)	JOMO Reductus 100,150

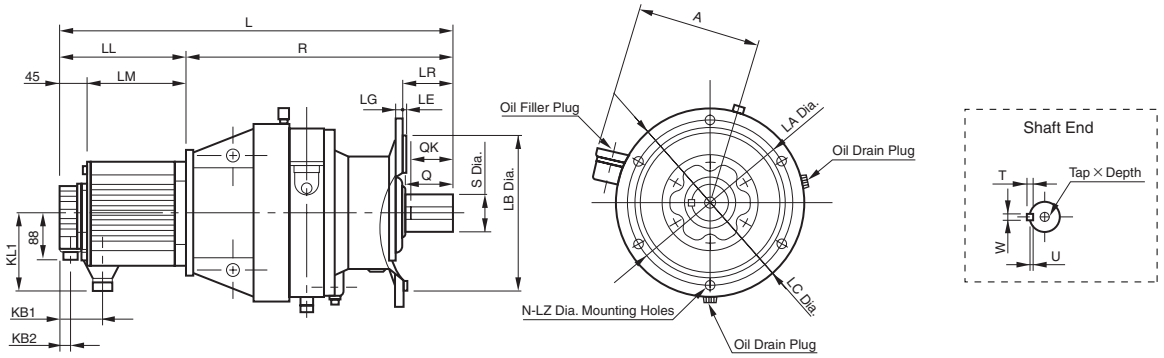
The following table shows the approximate amount of oil to be added.

Units: liter

Frame No.	6130 6135	6140	6160	6170 6175	6180 6185	6190
Horizontal Type	0.7	0.7	1.4	1.9	2.5	4.0

Flange-mounted Type with Standard Backlash Gears | External Dimensions Units: mm

(3) Large Oil Lubricating Type



Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	KB1	KB2	KL1	R	A
30P□AF761	CHVJ-6160	1/29	687	192	147	77	22	140	495	228
44P□AFC61	CHVJ-6160	1/21	721	226	181	77	22	140	495	228
44P□AF761	CHVJ-6170	1/29	785	226	181	77	22	140	559	243
55P□AFC61	CHVJ-6170	1/21	853	260	215	86	22	150	593	243
55P□AF761	CHVJ-6175	1/29	853	260	215	86	22	150	593	243
75P□AFB61	CHVJ-6160	1/11	863	334	289	86	22	150	529	228
75P□AFC61	CHVJ-6175	1/21	927	334	289	86	22	150	593	243
75P□AF761	CHVJ-6180	1/29	977	334	289	86	22	150	643	258

Model SGMGH-	Foot-mounted Dimensions								Shaft-end Dimensions							Approx. Mass kg
	LA	LB	LC	LE	LG	LR	N	LZ	Q	QK	S	T	U	W	Tap × Depth	
30P□AF761	310	$270^{-0.056}_{-0.137}$	340	4	20	89	6	11	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	121
44P□AFC61	310	$270^{-0.056}_{-0.137}$	340	4	20	89	6	11	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	126
44P□AF761	360	$316^{-0.062}_{-0.151}$	400	5	22	94	8	14	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	176
55P□AFC61	360	$316^{-0.062}_{-0.151}$	400	5	22	94	8	14	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	191
55P□AF761	360	$316^{-0.062}_{-0.151}$	400	5	22	94	8	14	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	191
75P□AFB61	310	$270^{-0.056}_{-0.137}$	340	4	20	89	6	11	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	150
75P□AFC61	360	$316^{-0.062}_{-0.151}$	400	5	22	94	8	14	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	201
75P□AF761	390	$345^{-0.062}_{-0.151}$	430	5	22	110	8	18	110	100	$80^{0}_{-0.019}$	14	9	22	M12×24	232

Note: Oil lubricating type (frame numbers: 6130 to 6190)
Servomotors of this type have been shipped with oil removed. Be sure to add oil until the red line at the upper side of the oil guage.
Lubrication oil recommended is industrial-use extreme-pressure gear oil of SP-system, JIS K 2219 industrial-use gear oil or equivalent. Refer to the following table.

Surrounding Air Temperature	Manufacturer						
	COSMO Oil Co., Ltd.	Nippon Oil Co., Ltd.	Idemitsu Oil & Gas Co., Ltd.	Showa Shell Sekiyu K.K.	Exxon Mobil Corporation.		JAPAN ENERGY CORPORATION
0°C to 35°C	COSMO Gear SE 100, 150	BON-NOCK M 100, 150	Daphne Super Gear Oil 100, 150	Shell Omala Oil 100, 150	Spartan EP 100, 150	Mobil Gear 627, 629 (ISO VG100, 150)	JOMO Reductus 100,150

The following table shows the approximate amount of oil to be added.

Units: liter

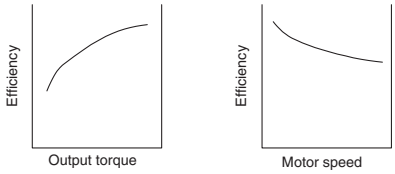
Frame No.	6130 6135	6140	6160	6170 6175	6180 6185	6190
Horizontal Type	0.7	0.7	1.4	1.9	2.5	4.0

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange-mounted (Omni-directional mounting)
Gear Lubricating Method: Grease
Gear Mechanism: Planetary gear mechanism

Thermal Class: F
Withstand Voltage: 200 V Servomotors, 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP44 (or the equivalent)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 0.05˚(3 min) at the gear output shaft
Gear Rotation Direction: Same direction as servomotor
Gear Lubrucating Method: Grease Lubricating Type

Servomotor Model SGMGH-	Servomotor			Gear Output					Moment of Inertia kg·m²×10⁻⁴	
	Output kW	Rated Speed min⁻¹	Rated Torque N·m	Gear Ratio	Rated Torque/ Efficiency* N·m/%	Instantaneous Peak Torque N·m/%	Rated Speed min⁻¹	Max. Speed min⁻¹	Motor + Gear	Gear
05A□AL14	0.45	1500	2.84	1/5	11.4/80	35.7/80	300	600	8.50	1.26
05A□AL24				1/9	20.4/80	64.2/80	167	334	8.18	0.94
05A□AL54				1/20	45.4/80	143/80	75	150	11.9	4.66
05A□AL74				1/29	65.9/80	207/80	51	102	10.0	2.76
05A□AL84				1/45	102/80	321/80	33	66	9.05	1.81
09A□AL14	0.85		5.39	1/5	21.6/80	55.2/80	300	600	15.2	1.30
09A□AL24				1/9	38.8/80	99.4/80	167	334	14.8	0.90
09A□AL54				1/20	86.2/80	221/80	75	150	18.6	4.70
09A□AL74				1/29	125/80	320/80	51	102	16.7	2.80
09A□AL84				1/45	194/80	497/80	33	66	18.4	4.50
13A□AL14	1.3		8.34	1/5	33.4/80	93.2/80	300	600	27.7	7.20
13A□AL24				1/9	60.0/80	168/80	167	334	25.3	4.80
13A□AL54				1/20	133/80	373/80	75	150	27.4	6.90
13A□AL74				1/29	193/80	541/80	51	102	30.9	10.4
13A□AL84				1/45	300/80	839/80	33	66	27.2	6.70
20A□AL14	1.8		11.5	1/5	46.0/80	115/80	300	600	41.9	10.2
20A□AL24				1/9	82.8/80	207/80	167	334	39.5	7.80
20A□AL54				1/20	184/80	459/80	75	150	51.9	20.2
20A□AL74				1/29	267/80	666/80	51	102	45.1	13.4
30A□AL14	2.9		18.6	1/5	74.4/80	182/80	300	600	66.4	20.4
30A□AL24				1/9	134/80	328/80	167	334	58.5	12.5
30A□AL54				1/20	298/80	730/80	75	150	66.2	20.2
44A□AL14	4.4		28.4	1/5	114/80	284/80	300	600	87.9	20.4
44A□AL24				1/9	204/80	512/80	167	334	80.0	12.5

*: Output torque and motor speed produce the following trends in efficiency. Values in the table are at the rated motor speed.



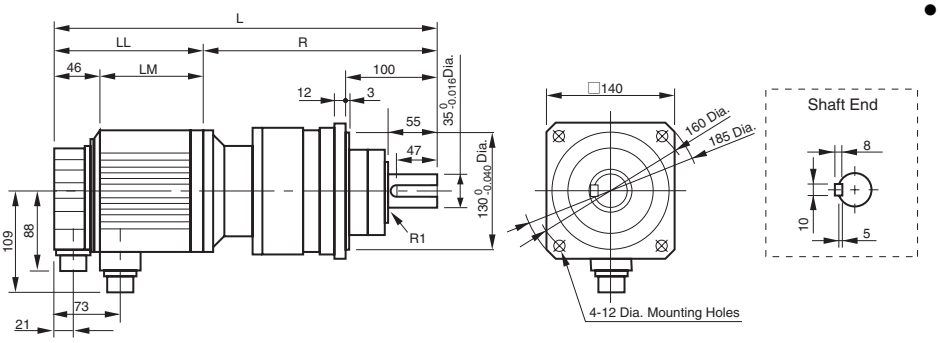
Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

With Low-backlash Gears | Ratings and Specifications

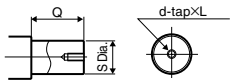
● Allowable Radial Load

Servomotor Model SGMGH-		Allowable Radial Load for Shaft Center (Fr) N
Grease-lubricating Type ·Flange Type	05A□AL14	833
	05A□AL24	980
	09A□AL14	833
	09A□AL24	980
	05A□AL54	2650
	05A□AL74	2940
	05A□AL84	3430
	09A□AL54	2650
	09A□AL74	2940
	09A□AL84	8040
	13A□AL14	1670
	13A□AL24	1960
	13A□AL54	2650
	13A□AL74	6860
	13A□AL84	8040
	20A□AL14	1670
	20A□AL24	1960
	20A□AL54	6080
	20A□AL74	6860
	30A□AL14	3820
	30A□AL24	4700
	30A□AL54	6080
	44A□AL14	3820
	44A□AL24	4700

● Small Grease Lubricating Type



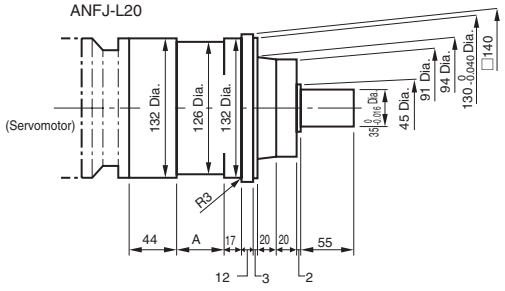
● Applied Specifications for Shaft-end Tap



Frame No.	Dia. S	Length Q	d×L mm
ANFJ-L20	35	55	M8×16
ANFJ-L30	50	75	M10×20
ANFJ-L40	60	90	M12×24

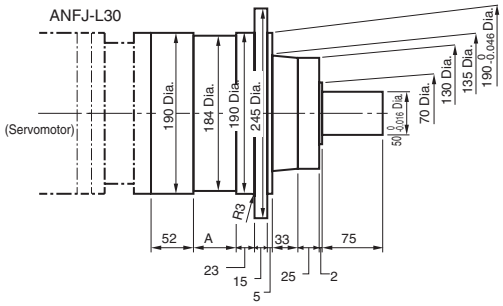
● Detailed Dimensions of Gears

ANFJ-L20



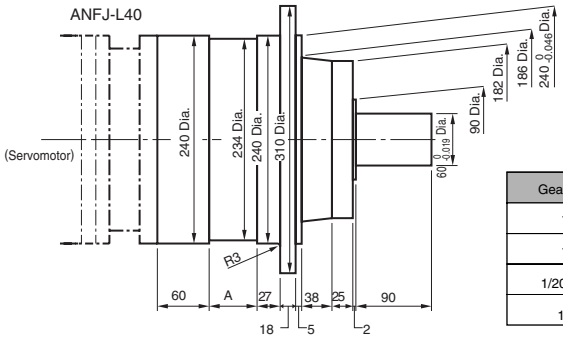
Gear Ratio	A
1/5	6
1/9	18
1/20, 1/29	37
1/45	47

ANFJ-L30



Gear Ratio	A
1/5	11
1/9	38
1/20, 1/29	42
1/45	52

ANFJ-L40



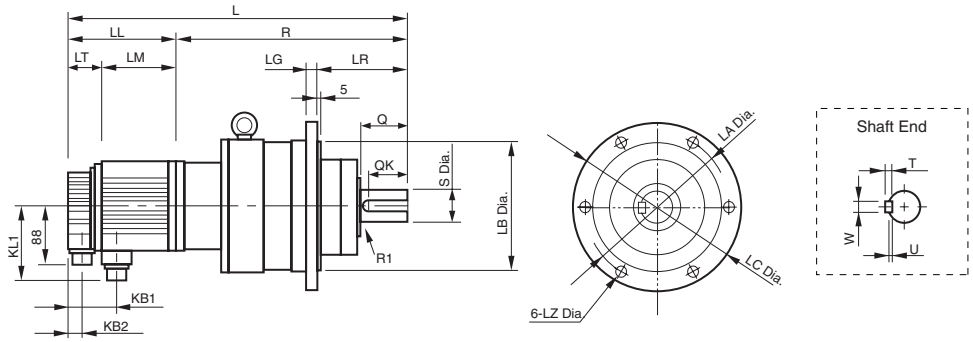
Gear Ratio	A
1/5	16
1/9	48
1/20, 1/29	48
1/45	58

Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	R	Approx. Mass kg
05A□AL141	ANFJ-L20	1/5	394	138	92	256	14
05A□AL241		1/9	406	138	92	268	14
09A□AL141		1/5	417	161	115	256	16
09A□AL241		1/9	429	161	115	268	16

Note: Since grease has been filled prior to shipment, the servomotors can be used without replenishing grease.

With Low-backlash Gears — External Dimensions Units: mm

● Large Grease Lubricating Type



Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	LR	LT	KB1	KB2	KL1	R	Flange Face Dimensions					Shaft-end Dimensions						Approx. Mass kg
												LA	LB	LC	LG	LZ	Q	QK	S	T	U	W	
05A□AL541	ANFJ-L30	1/20	491	138	92	140	46	73	21	109	353	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	31
05A□AL741		1/29	491	138	92	140	46	73	21	109	353	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	31
05A□AL841		1/45	501	138	92	140	46	73	21	109	363	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	31
09A□AL541		1/20	514	161	115	140	46	73	21	109	353	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	33
09A□AL741		1/29	514	161	115	140	46	73	21	109	353	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	33
09A□AL841	ANFJ-L40	1/45	565	161	115	160	46	73	21	109	404	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	53
13A□AL141	ANFJ-L30	1/5	507	185	139	140	46	73	21	109	322	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	28
13A□AL241		1/9	534	185	139	140	46	73	21	109	349	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	35
13A□AL541		1/20	538	185	139	140	46	73	21	109	353	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	35
13A□AL741	ANFJ-L40	1/29	579	185	139	160	46	73	21	109	394	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	55
13A□AL841		1/45	589	185	139	160	46	73	21	109	404	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	55
20A□AL141	ANFJ-L30	1/5	509	166	119	140	47	77	22	140	343	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	32
20A□AL241		1/9	536	166	119	140	47	77	22	140	370	220	190 $^{0}_{-0.046}$	245	15	12	75	65	50 $^{0}_{-0.016}$	9	5.5	14	39
20A□AL541	ANFJ-L40	1/20	581	166	119	160	47	77	22	140	415	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	39
20A□AL741		1/29	581	166	119	160	47	77	22	140	415	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	39
30A□AL141		1/5	575	192	145	160	47	77	22	140	383	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	53
30A□AL241		1/9	607	192	145	160	47	77	22	140	415	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	63
30A□AL541		1/20	607	192	145	160	47	77	22	140	415	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	63
44A□AL141		1/5	609	226	179	160	47	77	22	140	383	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	58
44A□AL241		1/9	641	226	179	160	47	77	22	140	415	280	240 $^{0}_{-0.046}$	310	18	14	90	78	60 $^{0}_{-0.019}$	11	7	18	68

Note: Since grease has been filled prior to shipment, the servomotors can be used without replenishing grease.

Servomotors

SGMGH

(1000 min^{-1})

Model Designation

● Without Gears

SGMGH - 03 A 2 B 2 1

(1st+2nd digits) (3rd digit) (4th digit) (5th digit) (6th digit) (7th digit)

1st + 2nd digits Rated Output

Code	Specifications	Code	Specifications
03	300 W	20	2.0 kW
06	600 W	30	3.0 kW
09	900 W	40	4.0 kW
12	1.2 kW	55	5.5 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)*
C	17-bit incremental encoder (standard)*

*: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
B	Standard
D	For high-performance machine tool*

*:Applicable only for models SGMGH-03 to -30.

6th digit Shaft End

Code	Specifications
2	Straight without key (standard)
3	Taper 1/10, with parallel key (optional)
5	Taper 1/10, with woodruff key (optional)*
6	Straight with key and tap (optional)

*: Applicable only for models SGMGH-03 and -06.

7th digit Options

Code	Specifications
1	Without options
B	With 90-VDC brake
C	With 24-VDC brake
D	With oil seal and 90-VDC brake
E	With oil seal and 24-VDC brake
S	With oil seal

Features

- High-speed driving of feed shafts for various machines
- Wide selection: 300 W to 5.5 kW capacity, brake and gear options
- Model for high-performance machine tools: Optional
- Mounted encoder: 17-bit, high resolution
- Standard protection level: IP67

Application Examples

- Machine tools
- Transfer machines
- Material handling machines
- Food processing equipment

●With Gears

SGMGH - 03 A 2 B L 1 4 1

1st+2nd digits | 3rd digit | 4th digit | 5th digit | 6th digit | 7th digit | 8th digit | 9th digit

1st + 2nd digits Rated Output

Code	Specifications	Code	Specifications
03	300 W	20	2.0 kW
06	600 W	30	3.0 kW
09	900 W	40	4.0 kW
12	1.2 kW	55	5.5 kW

3rd digit Power Supply Voltage

Code	Specifications
A	200 VAC (With Low-backlash gear)
P	200 VAC (With Standard backlash gear)

4th digit Encoder

Code	Specifications
2	17-bit absolute encoder (standard)
C	17-bit incremental encoder (standard)

Note: The number of encoder pulses is 32768 P/Rev.

5th digit Design Revision Order

Code	Specifications
B	Standard
D	For high-performance machine tool*

*: Applicable only for models SGMGH-03 to -30.

6th digit Gears

Code	Specifications
L	Low-backlash gear (Flange-mounted type)
E	Standard backlash gear (Foot-mounted type)
F	Standard backlash gear (Flange-mounted type)

7th digit Gear Ratio ○: Available

· Low-backlash gears (Flange-mounted type)

Code	Gear Ratio	SGMGH-□							
		03	06	09	12	20	30	40	55
1	1/5	s	s	s	s	s	s		
2	1/9	s	s	s	s	s	s		
5	1/20	s	s	s	s	s			
7	1/29	s	s	s	s				
8	1/45	s	s	s	s				

· Standard backlash gears*

Code	Gear Ratio	SGMGH-□							
		03	06	09	12	20	30	40	55
A	1/6	s	s	s	s	s	s	s	
B	1/11	s	s	s	s	s	s	s	s
C	1/21	s	s	s	s	s	s	s	s
7	1/29	s	s	s	s	s	s	s	s

*: Foot-mounted and flange-mounted types are available.

8th digit Shaft End

Code	Specifications
4	Straight with key (Available only for SGMGH with low-backlash gear)
6	Straight with key and tap (Available only for SGMGH with standard-backlash gear)

9th digit Brakes

Code	Specifications
1	Without brake
B	With 90-VDC brake
C	With 24-VDC brake

Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Thermal Class: F
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP67 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive

Voltage		200 V							
Servomotor Model SGMGH-□□□□□		03A□B	06A□B	09A□B	12A□B	20A□B	30A□B	40A□B	55A□B
Rated Output*1	kW	0.3	0.6	0.9	1.2	2.0	3.0	4.0	5.5
Rated Torque*1	N·m	2.84	5.68	8.62	11.5	19.1	28.4 (21.6)*3	38.2	52.6
Instantaneous Peak Torque*1	N·m	7.17	14.1	19.3	28.0	44.0	63.7	107	136.9
Rated Current*1	Arms	3.0	5.7	7.6	11.6	18.5	24.8 (18.9)*3	30.0	43.2
Instantaneous Max. Current*1	Arms	7.3	13.9	16.6	28	42	56	84	110
Rated Speed*1	min^{-1}	1000							
Max. Speed*1	min^{-1}	2000							
Torque Constant	N·m/Arms	1.03	1.06	1.21	1.03	1.07	1.19	1.34	1.26
Rotor Moment of Inertia*2	$kg·m^2×10^{-4}$	7.24 (9.34)	13.9 (16.0)	20.5 (22.6)	31.7 (40.2)	46.0 (54.5)	67.5 (76.0)	89.0 (97.5)	125 (133.5)
Rated Power Rate*1	kW/s	11.2	23.2	36.3	41.5	79.4	120	164	221
Rated Angular Acceleration*1	rad/s^2	3930	4080	4210	3620	4150	4210	4290	4200

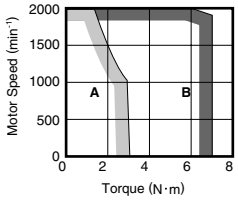
*1: These tems and torque-motor speed characteristics quoted in combination with an SGDS SERVOPACK are at an armature winding temperature of 20℃.
*2: The values in the parentheses are for servomotors with holding brakes.
*3: If using the SGMGH-30A□B servomotor and the SGDS-30 SERVOPACK together, take into consideration of the rated value in the parentheses.
Note: These characteristics are values with the following iron plate (heat sink) attached for cooling.
SGMGH-03, 06, 09: 400×400×20 (mm)
SGMGH-12, 20, 30, 40, 55: 550×550×30 (mm)

Ratings and Specifications

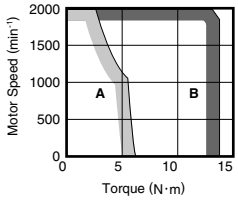
● Torque-motor Speed Characteristics

A Continuous Duty Zone B Intermittent Duty Zone

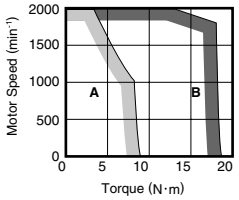
SGMGH-03A□B



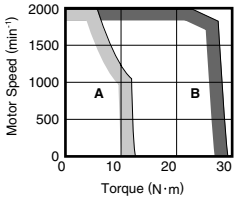
SGMGH-06A□B



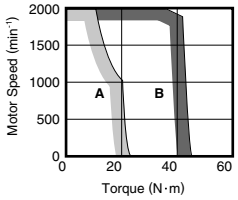
SGMGH-09A□B



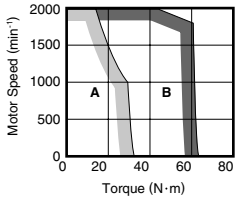
SGMGH-12A□B



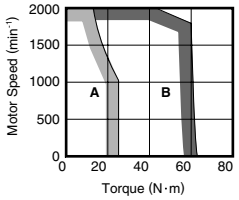
SGMGH-20A□B



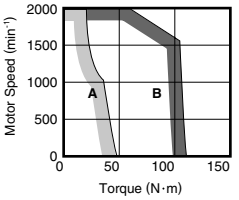
SGMGH-30A□B
(In combination with SGDS-50A SERVOPACK)



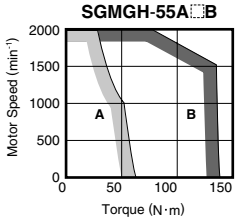
SGMGH-30A□B
(In combination with SGDS-30A SERVOPACK)



SGMGH-40A□B



SGMGH-55A□B



● Holding Brake Electrical Specifications

Holding Brake Rated Voltage	Servomotor Model	Servomotor Capacity W	Holding Brake Specifications			
			Capacity W	Holding Torque N·m	Coil Resistance Ω (at 20˚C)	Rated Current A (at 20˚C)
90 VDC	SGMGH-03	300	10.1	4.41	804	0.11
	SGMGH-06	600	10.1	12.7	804	0.11
	SGMGH-09	900	10.1	12.7	804	0.11
	SGMGH-12	1200	18.5	43.1	438	0.21
	SGMGH-20	2000	18.5	43.1	438	0.21
	SGMGH-30	3000	18.5	43.1	438	0.21
	SGMGH-40	4000	23.5	72.6	327	0.28
	SGMGH-55	5500	23.5	72.6	327	0.28
24 VDC	SGMGH-03	300	9.85	4.41	58.7	0.41
	SGMGH-06	600	9.85	12.7	58.7	0.41
	SGMGH-09	900	9.85	12.7	58.7	0.41
	SGMGH-12	1200	18.5	43.1	31.1	0.77
	SGMGH-20	2000	18.5	43.1	31.1	0.77
	SGMGH-30	3000	18.5	43.1	31.1	0.77
	SGMGH-40	4000	23.5	72.6	22.8	1.05
	SGMGH-55	5500	23.5	72.6	22.8	1.05

Note: The holding brake is only used to hold the load and cannot be used to stop the servomotor.

● Allowable Load Moment of Inertia at the Motor Shaft

The rotor moment of inertia ratio is the value for a servomotor without a gear and a brake.

Servomotor Model	Capacity Range	Allowable Load Moment of Inertia (Rotor Moment of Inertia Ratio)
SGMGH (1000 min^{-1})	300 W to 5.5 kW	×5*

*: The allowable load moment of inertia will be three times when the SGMGH-30A□B servomotor and the SGDS-30 SERVOPACK are used together.

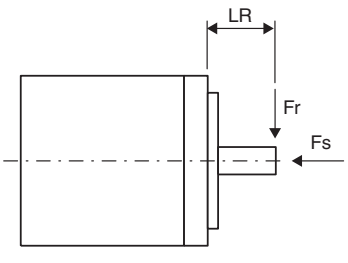
● Load Moment of Inertia

The larger the load moment of inertia, the worse the movement response of the load.
The size of the load moment of inertia (J_L) allowable when using a servomotor depends on motor capacity and is limited to within 5 to 30 times the moment of inertia of each servomotor (J_M). This value is provided strictly as a guideline and results may vary depending on servomotor drive conditions.
An overvoltage alarm (A.400) is likely to occur during deceleration if the load moment of inertia exceeds the allowable load moment of inertia. SERVOPACKs with a built-in regenerative resistor may generate a regeneration overload alarm (A.320). Take one of the following steps if this occurs.

- Reduce the torque limit.
- Reduce the deceleration rate.
- Reduce the maximum motor speed.
- Install an external regenerative resistor if the alarm cannot be cleared. Contact your Yaskawa Application Engineering Department.

● Allowable Radial and Thrust Loads

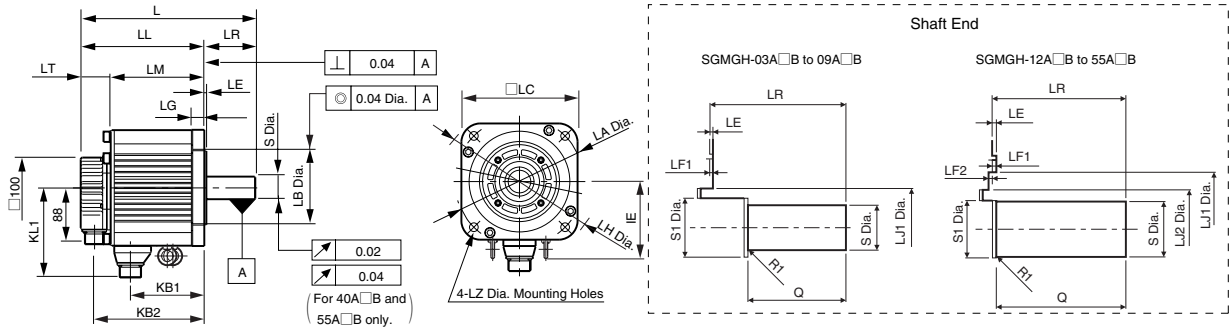
Design the mechanical system so thrust and radial loads applied to the servomotor shaft end during operation fall within the ranges shown in the table below.

Servomotor Model		Allowable Radial Load (Fr) N	Allowable Thrust Load (Fs) N	LR mm	Reference Diagram
SGMGH- (1000 min^{-1})	03A□B21	490	98	58	
	06A□B21	490	98	58	
	09A□B21	686	343	58	
	12A□B21	1176	490	79	
	20A□B21	1470	490	79	
	30A□B21	1470	490	79	
	40A□B21	1764	588	113	
	55A□B21	1764	588	113	

External Dimensions Units: mm

● Without Brakes

(1) 300 W to 5.5 kW



Note: For the specifications of the other shaft ends, refer to page 144.

Model SGMGH-	L	LL	LM	LR	LT	KB1	KB2	IE	KL1	Flange Face Dimensions											Shaft-end Dimensions			Approx. Mass kg
										LA	LB	LC	LE	LF1	LF2	LG	LH	LJ1	LJ2	LZ	S	S1	Q	
03A□B21	196	138	92	58	46	65	117	—	109	145	110 $^{0}_{-0.035}$	130	6	6	—	12	165	45	—	9	19 $^{0}_{-0.013}$	30	40	5.5
06A□B21	219	161	115	58	46	88	140	—	109	145	110 $^{0}_{-0.035}$	130	6	6	—	12	165	45	—	9	19 $^{0}_{-0.013}$	30	40	7.6
09A□B21	243	185	139	58	46	112	164	—	109	145	110 $^{0}_{-0.035}$	130	6	6	—	12	165	45	—	9	22 $^{0}_{-0.013}$	30	40	9.6
12A□B21	245	166	119	79	47	89	144	—	140	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	14
20A□B21	271	192	145	79	47	115	170	—	140	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	18
30A□B21	305	226	179	79	47	149	204	—	140	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	23
40A□B21	373	260	213	113	47	174	238	123	150	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	42 $^{0}_{-0.016}$	45	110	30
55A□B21	447	334	287	113	47	248	312	123	150	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	42 $^{0}_{-0.016}$	45	110	40

Note: Models with oil seals are of the same configuration.

· Connector Specifications for Encoder

(17-bit Encoder)

Receptacle: MS3102A20-29P
Applicable plug (To be provided by the customer)
Plug: MS3108B20-29S
Cable clamp: MS3057-12A

With an Absolute Encoder

A	–	K	–
B	–	L	–
C	DATA+	M	–
D	DATA–	N	–
E	–	P	–
F	–	R	–
G	0V	S	BATT–
H	+5 VDC	T	BATT+
J	FG (Frame ground)	–	–

With an Incremental Encoder

A	–	K	–
B	–	L	–
C	DATA+	M	–
D	DATA–	N	–
E	–	P	–
F	–	R	–
G	0V	S	–
H	+5 VDC	T	–
J	FG (Frame ground)	–	–

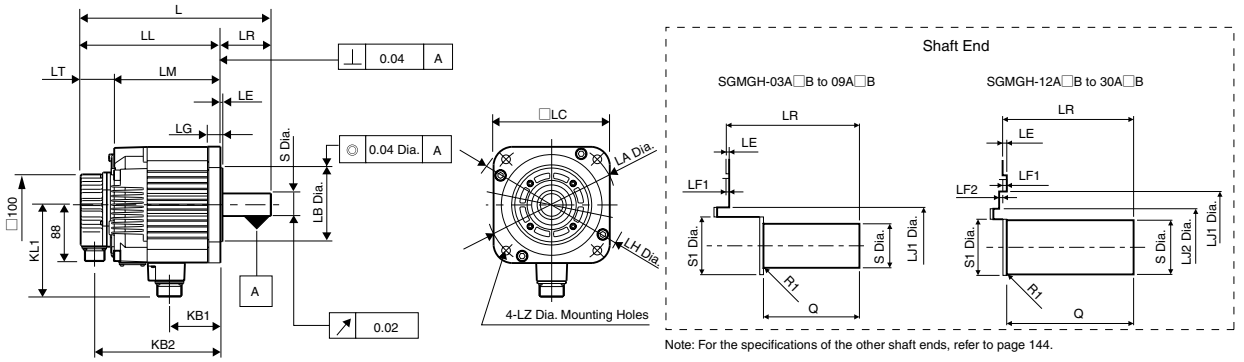
· Connector Specifications for Servomotor

A	Phase U
B	Phase V
C	Phase W
D	FG (Frame ground)

External Dimensions Units: mm

● With Brakes

(1) 300 W to 3.0 kW



Note: For the specifications of the other shaft ends, refer to page 144.

Model SGMGH-	L	LL	LM	LR	LT	KB1	KB2	KL1	Flange Face Dimensions											Shaft-end Dimensions			Approx. Mass kg
									LA	LB	LC	LE	LF1	LF2	LG	LH	LJ1	LJ2	LZ	S	S1	Q	
03A□B2□	234	176	130	58	46	56	154	120	145	110 $^{0}_{-0.035}$	130	6	6	—	12	165	45	—	9	19 $^{0}_{-0.013}$	30	40	7.5
06A□B2□	257	199	153	58	46	79	177	120	145	110 $^{0}_{-0.035}$	130	6	6	—	12	165	45	—	9	19 $^{0}_{-0.013}$	30	40	9.6
09A□B2□	281	223	177	58	46	103	201	120	145	110 $^{0}_{-0.035}$	130	6	6	—	12	165	45	—	9	22 $^{0}_{-0.013}$	30	40	12
12A□B2□	296	217	169	79	48	79	195	146	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	19
20A□B2□	322	243	195	79	48	105	221	146	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	23.5
30A□B2□	356	277	229	79	48	139	255	146	200	114.3 $^{0}_{-0.025}$	180	3.2	3	0.5	18	230	76	62	13.5	35 $^{+0.01}_{0}$	45	76	28.5

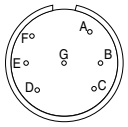
Note: Models with oil seals are of the same configuration.

· Connector Specifications for Encoder

(17-bit Encoder)

Receptacle: MS3102A20-29P
Applicable plug (To be provided by the customer)
Plug: MS3108B20-29S
Cable clamp: MS3057-12A

· Connector Specifications for Servomotor



A	Phase U	E	Brake terminal
B	Phase V	F	Brake terminal
C	Phase W	G	—
D	FG (Frame ground)	—	—

Note: No polarity for connection to the brake terminals

With an Absolute Encoder

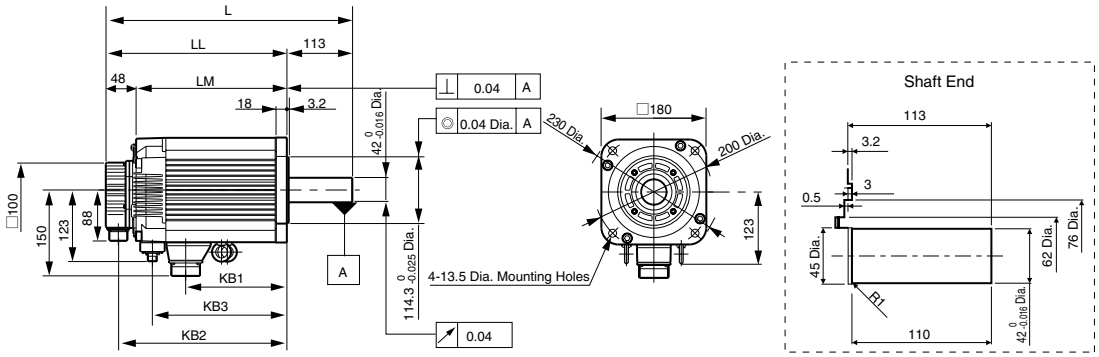
A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA—	N	—
E	—	P	—
F	—	R	—
G	0V	S	BATT—
H	+5 VDC	T	BATT+
J	FG (Frame ground)	—	—

With an Incremental Encoder

A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA—	N	—
E	—	P	—
F	—	R	—
G	0V	S	—
H	+5 VDC	T	—
J	FG (Frame ground)	—	—

External Dimensions Units: mm

(2) 4.0 kW to 5.5 kW



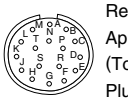
Note: For the specifications of the other shaft ends, refer to page 144.

Model SGMGH-	L	LL	LM	KB1	KB2	KB3	Approx. Mass kg
40A□B2□	424	311	263	174	289	231	35
55A□B2□	498	385	337	248	363	305	45.5

Note: Models with oil seals are of the same configuration.

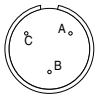
· Connector Specifications for Encoder

(17-bit Encoder)



Receptacle: MS3102A20-29P
Applicable plug
(To be provided by the customer)
Plug: MS3108B20-29S
Cable clamp: MS3057-12A

· Connector Specifications for Brake



A	Brake terminal
B	Brake terminal
C	–

Note: No polarity for connection to the brake terminals

· Connector Specifications for Servomotor

A	Phase U
B	Phase V
C	Phase W
D	FG (Frame ground)

With an Absolute Encoder

A	–	K	–
B	–	L	–
C	DATA+	M	–
D	DATA–	N	–
E	–	P	–
F	–	R	–
G	0V	S	BATT–
H	+5 VDC	T	BATT+
J	FG (Frame ground)	–	–

With an Incremental Encoder

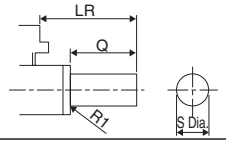
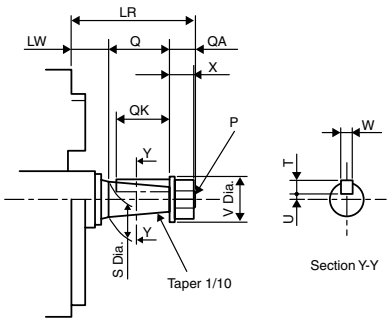
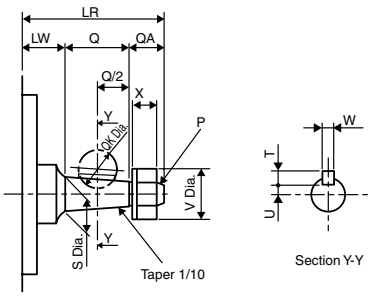
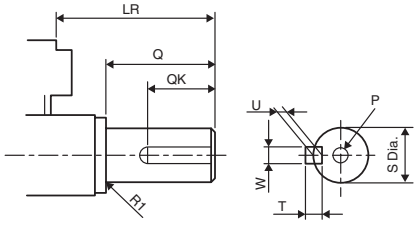
A	–	K	–
B	–	L	–
C	DATA+	M	–
D	DATA–	N	–
E	–	P	–
F	–	R	–
G	0V	S	–
H	+5 VDC	T	–
J	FG (Frame ground)	–	–

External Dimensions Units: mm

● Shaft End Specifications

SGMGH - □□□□□□□□

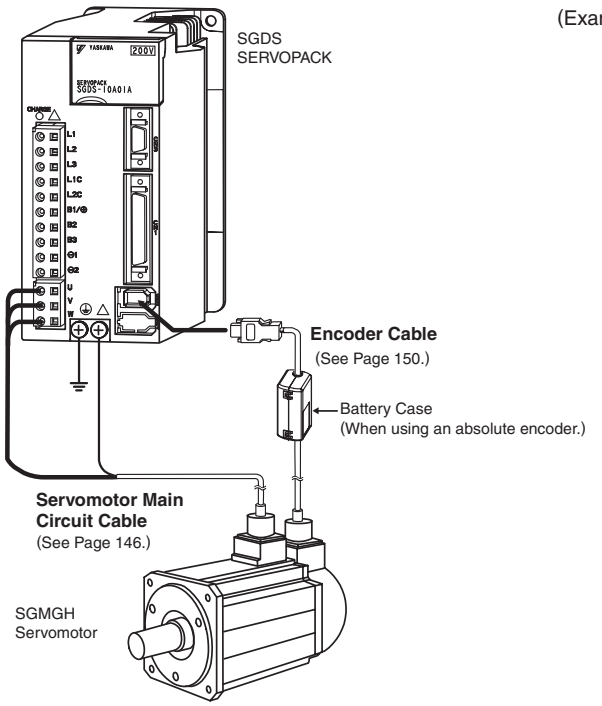
Symbol	Specifications	Remarks
2	Straight, without key	Standard
3	Taper 1/10, with parallel key (Key slot is JISB1301-1976 high precision. SGMGH series is interchangeable with USAGED series.)	Optional
5	Taper 1/10, with woodruff key (Set only for SGMGH-03 and -06. Woodruff key is JISB1302.)	
6	Straight, with key and tap for one location (Key slot is JISB1301-1976 high precision. Key slot tolerance is JISB1301. Both key and tap are included.)	

Symbol	Specifications	Shaft End		Model: SGMGH-							
				03A□B	06A□B	09A□B	12A□B	20A□B	30A□B	40A□B	55A□B
2	Straight, without Key		LR	58			79				113
			Q	40			76				110
			S	19 $^{0}_{-0.013}$		22 $^{0}_{-0.013}$	35 $^{+0.01}_{0}$			42 $^{0}_{-0.016}$	
3	Taper 1/10, with Parallel Key		LR	58			102				132
			LW	18			22				
			Q	28			58				82
			QA	12			22				28
			QK	25			50				70
			X	10.3			19.2				23
			S	16		19	32				42
			V	21			37				44
			P	M10, P1.25			M20, P1.5				M24, P2.0
			W	5			7				10
			T	5			7				8
			U	4.3		5.8	10.55				13.95
5	Taper 1/10, with Woodruff Key		LR	58		—	—				—
			LW	18							
			Q	28							
			QA	12							
			QK	16							
			X	10.3							
			S	16							
			V	21							
			P	M10,P1.25							
			W	5							
			T	2							
			U	4.5							
6	Straight, with Key and Tap		LR	58			79				113
			Q	40			76				110
			QK	25			60				90
			S	19 $^{0}_{-0.013}$		22 $^{0}_{-0.013}$	35 $^{+0.01}_{0}$			42 $^{0}_{-0.016}$	
			W	5		6	10				12
			T	5		6	8				
			U	3		3.5	5				
			P	M5 screw, depth: 12			M12 screw, depth: 25			M16 screw, depth: 32	

Selecting Cable

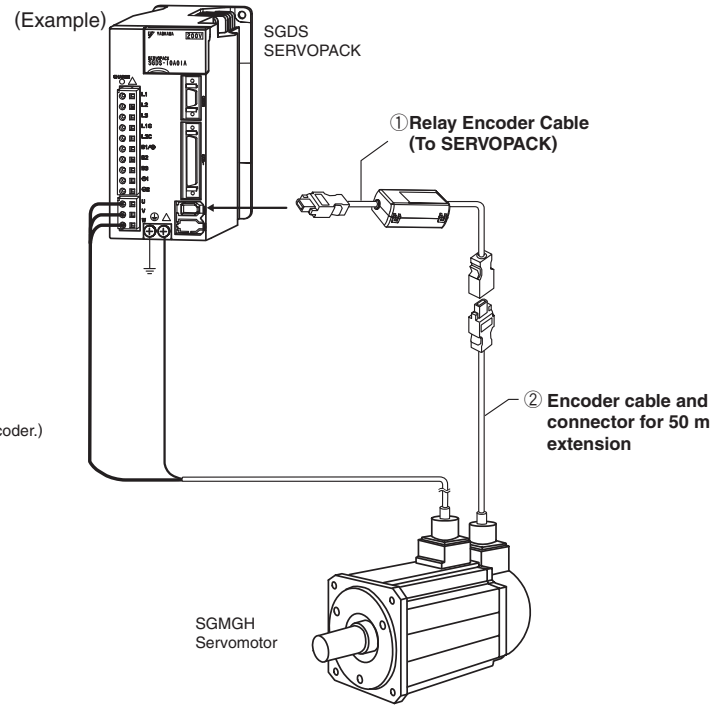
● Cable Connections

· For Standard Wiring



· For Encoder Cable Extensions from 30 m up to 50 m

(See Page 152.)



⚠ CAUTION
Separate the servomotor main circuit wiring from the I/O signal cable and encoder cable at least 30 cm, and do not bundle or run them in the same duct.

Selecting Cable

● Servomotor Main Circuit Cables

Customers must assemble the servomotor's main circuit cables and attach connectors to connect the SERVOPACKs and the SGMGH servomotors.

Use the connectors specified by Yaskawa when assembling the cable. Select the appropriate type of connector in accordance with the motor application. The following two types of connectors are available for SGMSS servomotors.

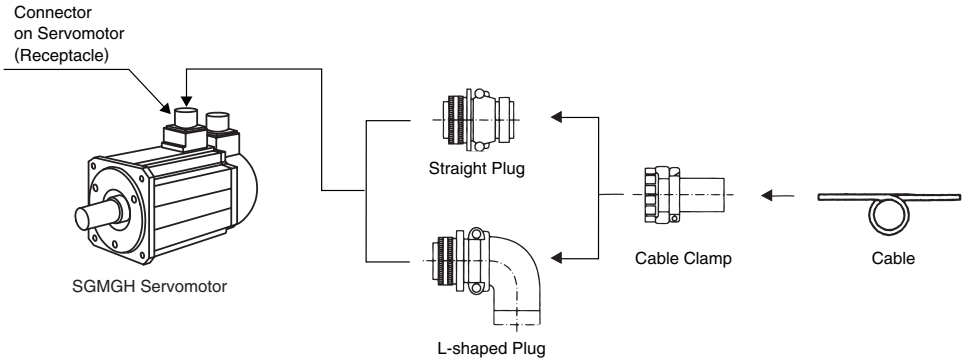
· Standard

· IP67 rated and compliant to European Safety standards

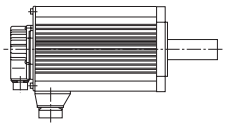
The cables have no restrictions. Use appropriate cables for the connectors.

● Connectors: Standard

· Connector Configuration



(1) Without Holding Brakes



0.3 kW to 5.5 kW

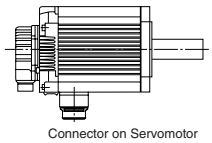
Connector on Servomotor
0.3 kW to 5.5 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor		
		Straight Plug	L-shaped Plug	Cable Clamp
0.3 0.6 0.9	MS3102A18-10P	MS3106B18-10S	MS3108B18-10S	MS3057-10A
1.2 2.0 3.0	MS3102A22-22P	MS3106B22-22S	MS3108B22-22S	MS3057-12A
4.0 5.5	MS3102A32-17P	MS3106B32-17S	MS3108B32-17S	MS3057-20A

(2) With Holding Brakes

4.0 kW to 5.5 kW servomotors require connectors on servomotors and brake power supply connectors.

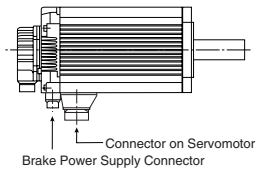


0.3 kW to 5.5 kW

Connector on Servomotor
0.3 kW to 5.5 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor		
		Straight Plug	L-shaped Plug	Cable Clamp
0.3 0.6 0.9	MS3102A20-15P	MS3106B20-15S	MS3108B20-15S	MS3057-12A
1.2 2.0 3.0	MS3102A24-10P	MS3106B24-10S	MS3108B24-10S	MS3057-16A
4.0 5.5	MS3102A32-17P	MS3106B32-17S	MS3108B32-17S	MS3057-20A



4.0 kW to 5.5 kW

Brake Power Supply Connector
4.0 kW to 5.5 kW

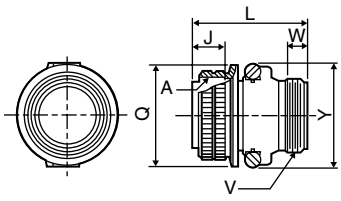


Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor		
		Straight Plug	L-shaped Plug	Cable Clamp
4.0 5.5	MS3102A10SL-3P	MS3106A10SL-3S	Use a connector that is IP67 rated and compliant to European Safety standards	MS3057-4A

Selecting Cable Units: mm

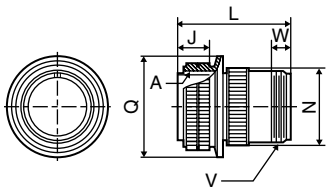
· Dimensional Drawings: Cable Connectors to Servomotors

(1) MS3106B□□-□□S: Straight Plug



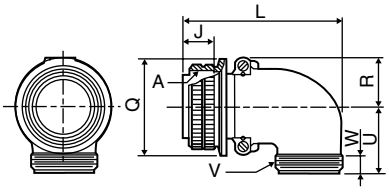
Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L Max.	Outer Diameter of Joint Nut $Q^{+0}_{-0.38}$	Cable Clamp Set Screw V	Effective Screw Length W Max.	Maximum Width Y Max.
18	1-1/8-18UNEF	18.26	52.37	34.13	1-20UNEF	9.53	42
20	1-1/4-18UNEF	18.26	55.57	37.28	1-3/16-18UNEF	9.53	47
22	1-3/8-18UNEF	18.26	55.57	40.48	1-3/16-18UNEF	9.53	50
24	1-1/2-18UNEF	18.26	58.72	43.63	1-7/16-18UNEF	9.53	53
32	2-18UNS	18.26	61.92	56.33	1-3/4-18UNS	11.13	66

(2) MS3106B10SL-3S: Straight Plug



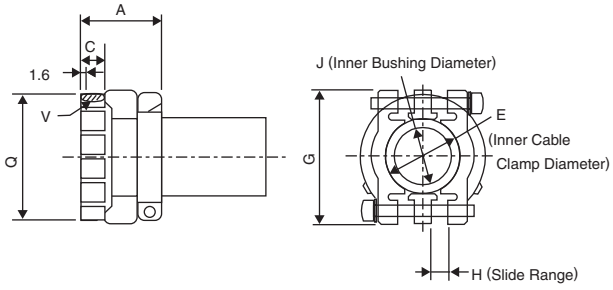
Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L±0.5	Outer Diameter of Joint Nut $Q^{+0}_{-0.38}$	Outer Diameter N±0.5	Cable Clamp Set Screw V	Effective Screw Length W Max.
18	5/8-24UNEF	13.49	34.9	22.22	19.2	5/8-24UNEF	9.53

(3) MS3108B□□-□□S: L-shaped Plug



Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L Max.	Outer Diameter of Joint Nut $Q^{+0}_{-0.38}$	R ±0.5	U ±0.5	Cable Clamp Set Screw V	Effective Screw Length W Max.
18	1-1/8-18UNEF	18.26	68.27	34.13	20.5	30.2	1-20UNEF	9.53
20	1-1/4-18UNEF	18.26	76.98	37.28	22.5	33.3	1-3/16-18UNEF	9.53
22	1-3/8-18UNEF	18.26	76.98	40.48	24.1	33.3	1-3/16-18UNEF	9.53
24	1-1/2-18UNEF	18.26	86.51	43.63	25.6	36.5	1-7/16-18UNEF	9.53
32	2-18UNS	18.26	95.25	56.33	32.8	44.4	1-3/4-18UNS	11.13

(4) MS3057-□□A: Cable Clamp with Rubber Bushing

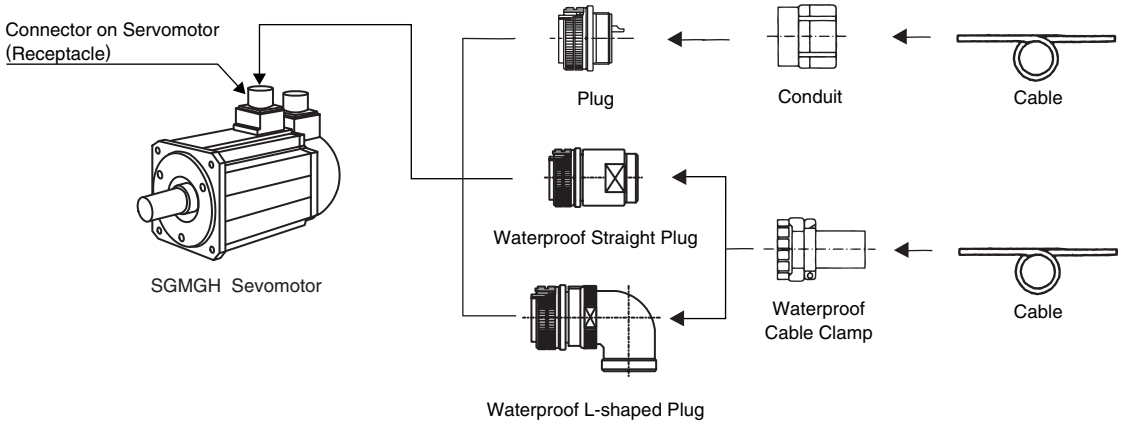


Cable Clamp Type	Applicable Connector Shell Size	Overall Length A±0.7	Effective Screw Length C	E	G±0.7	H	J	Set Screw V	Outer Diameter Q±0.7	Attached Bushing
MS3057-4A	10SL	20.6	10.3	7.9	22.2	1.6	5.6	5/8-24UNEF	20.6	AN3420-4
MS3057-10A	18	23.8	10.3	15.9	31.7	3.2	14.3	1-20UNEF	30.1	AN3420-10
MS3057-12A	20,22	23.8	10.3	19.0	37.3	4.0	15.9	1-3/16-18UNEF	35.0	AN3420-12
MS3057-16A	24	26.2	10.3	23.8	42.9	4.8	19.1	1-7/16-18UNEF	42.1	AN3420-16
MS3057-20A	32	27.8	11.9	31.7	51.6	6.3	23.8	1-3/4-18UNS	51.6	AN3420-20

Selecting Cable

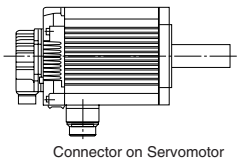
● Connectors: IP67 Rated and Compliant to European Safety Standards

· Connector Configuration



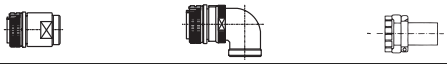
Note: For the conduit grounding, contact the manufacturer of the conduit being used.

(1) Without Holding Brakes



0.3 kW to 5.5 kW

Connector on Servomotor
0.3 kW to 3.0 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Straight Plug	L-shaped Plug	Cable Clamp	Applicable Cable Range (For Reference) mm	Manufacturer
0.3	CE05-2A18-10PD-B	CE05-6A18-10SD-B-BSS	CE05-8A18-10SD-B-BAS	CE3057-10A-1	10.5 to 14.1 dia.	DDK Ltd.
0.6				CE3057-10A-2	8.5 to 11.0 dia.	
0.9				CE3057-10A-3	6.5 to 8.7 dia.	
1.2	JL04HV-2E22-22PE-B	JL04V-6A22-22SE-EB or JA06A-22-22S-J1-EB	JL04V-8A22-22SE-EB or JA08A-22-22S-J1-EB	JL04-2022CK (09)	6.5 to 9.5 dia.	Japan Aviation Electronics Industry, Ltd.
2.0				JL04-2022CK (12)	9.5 to 13.0 dia.	
3.0				JL04-2022CK (14)	12.9 to 15.9 dia.	

Notes: 1 Select a cable clamp in accordance with the applied cable diameter.
2 The straight plug (JA06A-22-22S-J1-EB) and the L-shaped plug (JA08A-22-22S-J1-EB) conform only to IP67 standards for environmental protection of enclosures.

Connector on Servomotor
4.0 kW to 5.5 kW

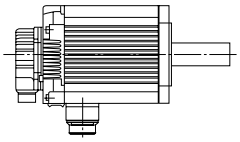
Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Plug	Straight Plug	L-shaped Plug	Applicable Cable Range (For Reference) mm	Manufacturer
4.0 5.5	JL04V-2E32-17PE-B	JL04V-6A32-17SE	ACS-16RL-MS32F	ACA-16RL-MS32F	12.0 to 16.0 dia.	Japan Aviation Electronics Industry, Ltd.
			ACS-20RL-MS32F	ACA-20RL-MS32F	16.0 to 20.0 dia.	
			ACS-24RL-MS32F	ACA-24RL-MS32F	20.0 to 24.0 dia.	
			ACS-28RL-MS32F	ACA-28RL-MS32F	24.0 to 28.0 dia.	
			ACS-32RL-MS32F	ACA-32RL-MS32F	28.0 to 32.0 dia.	
			ACS-36RL-MS32F	ACA-36RL-MS32F	32.0 to 36.0 dia.	

Note: Select a conduit in accordance with the applied cable diameter.

Selecting Cable

(2) With Holding Brakes

4.0 kW to 5.5 kW servomotors require connectors on servomotors and brake power supply connector.



Connector on Servomotor

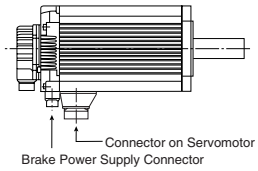
0.3 kW to 3.0 kW

Connector on Servomotor
0.3 kW to 3.0 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Straight Plug	L-shaped Plug	Cable Clamp	Applicable Cable Range (For Reference) mm	Manufacturer
0.3	JL04V-2E20-15PE-B	JL04V-6A20-15SE-EB	JL04V-8A20-15SE-EB	JL04-2022CK(09)	6.5 to 9.5 dia.	Japan Aviation Electronics Industry, Ltd.
0.6				JL04-2022CK(12)	9.5 to 13.0 dia.	
0.9				JL04-2022CK(14)	12.9 to 15.9 dia.	
1.2	JL04V-2E24-10PE-B	JL04V-6A24-10SE-EB or JA06A-24-10S-J1-EB	JL04V-8A24-10SE-EB or JA08A-24-10S-J1-EB	JL04-2428CK(11)	9.0 to 12.0 dia.	
2.0				JL04-2428CK(14)	12.0 to 15.0 dia.	
3.0				JL04-2428CK(17)	15.0 to 18.0 dia.	
				JL04-2428CK(20)	18.0 to 20.0 dia.	

Notes: 1 Select a cable clamp in accordance with the applied cable diameter.
2 The straight plug (JA06A-24-10S-J1-EB) and the L-shaped plug (JA08A-24-10S-J1-EB) conform only to IP67 standards for environmental protection of enclosures.



Connector on Servomotor
Brake Power Supply Connector

4.0 kW to 5.5 kW

Connector on Servomotor
4.0 kW to 5.5 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Plug	Conduit		Applicable Cable Range (For Reference) mm	Manufacturer
			Straight Plug	L-shaped Plug		
4.0	JL04V-2E32-17PE-B	JL04V-6A32-17SE	ACS-16RL-MS32F	ACA-16RL-MS32F	12.0 to 16.0 dia.	Japan Aviation Electronics Industry, Ltd.
			ACS-20RL-MS32F	ACA-20RL-MS32F	16.0 to 20.0 dia.	
5.5			ACS-24RL-MS32F	ACA-24RL-MS32F	20.0 to 24.0 dia.	
			ACS-28RL-MS32F	ACA-28RL-MS32F	24.0 to 28.0 dia.	
			ACS-32RL-MS32F	ACA-32RL-MS32F	28.0 to 32.0 dia.	
			ACS-36RL-MS32F	ACA-36RL-MS32F	32.0 to 36.0 dia.	

Note: Select a conduit in accordance with the applied cable diameter.

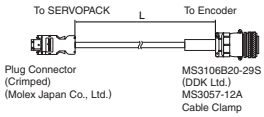
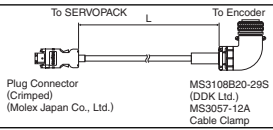
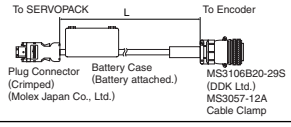
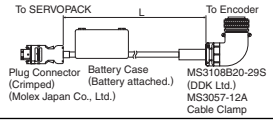
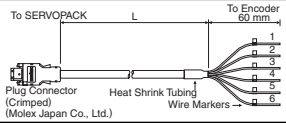
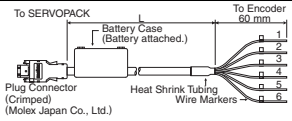
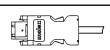
Brake Power Supply Connector
4.0 kW to 5.5 kW



Servomotor Capacity kW	Connector on Servomotor (Receptacle)	Cable Connector to Servomotor				
		Straight Plug	L-shaped Plug	Cable Clamp	Applicable Cable Range (For Reference) mm	Manufacturer
4.0	CE05-2A10SL-3PC-B	CE05-6A10SL -3SC-B-BSS	CE05-8A10SL -3SC-B-BAS	CE3057-4A-1	3.6 to 5.6 dia.	DDK Ltd.
5.5						

Selecting Cable

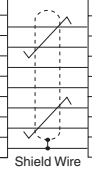
● Encoder Cables and Connectors (For Standard Wiring)

Name	Length (L)	Order No.		Specifications	Details
		Standard Cable	Flexible Cable*		
Encoder Cable with Connectors (For Incremental Encoder)	3 m	JZSP-CMP01-03-E	JZSP-CMP11-03-E		(1)
	5 m	JZSP-CMP01-05-E	JZSP-CMP11-05-E		
	10 m	JZSP-CMP01-10-E	JZSP-CMP11-10-E		
	15 m	JZSP-CMP01-15-E	JZSP-CMP11-15-E		
	20 m	JZSP-CMP01-20-E	JZSP-CMP11-20-E		
	3 m	JZSP-CMP02-03-E	JZSP-CMP12-03-E		
	5 m	JZSP-CMP02-05-E	JZSP-CMP12-05-E		
	10 m	JZSP-CMP02-10-E	JZSP-CMP12-10-E		
	15 m	JZSP-CMP02-15-E	JZSP-CMP12-15-E		
	20 m	JZSP-CMP02-20-E	JZSP-CMP12-20-E		
Encoder Cable with Connectors (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP06-03-E	JZSP-CSP26-03-E		(2)
	5 m	JZSP-CSP06-05-E	JZSP-CSP26-05-E		
	10 m	JZSP-CSP06-10-E	JZSP-CSP26-10-E		
	15 m	JZSP-CSP06-15-E	JZSP-CSP26-15-E		
	20 m	JZSP-CSP06-20-E	JZSP-CSP26-20-E		
	3 m	JZSP-CSP07-03-E	JZSP-CSP27-03-E		
	5 m	JZSP-CSP07-05-E	JZSP-CSP27-05-E		
	10 m	JZSP-CSP07-10-E	JZSP-CSP27-10-E		
	15 m	JZSP-CSP07-15-E	JZSP-CSP27-15-E		
	20 m	JZSP-CSP07-20-E	JZSP-CSP27-20-E		
Encoder Cable with Loose Wires at Encoder End (For Incremental Encoder)	3 m	JZSP-CMP03-03-E	JZSP-CMP13-03-E		(3)
	5 m	JZSP-CMP03-05-E	JZSP-CMP13-05-E		
	10 m	JZSP-CMP03-10-E	JZSP-CMP13-10-E		
	15 m	JZSP-CMP03-15-E	JZSP-CMP13-15-E		
	20 m	JZSP-CMP03-20-E	JZSP-CMP13-20-E		
Encoder Cable with Loose Wires at Encoder End (For Absolute Encoder, with a Battery Case)	3 m	JZSP-CSP04-03-E	JZSP-CSP24-03-E		(4)
	5 m	JZSP-CSP04-05-E	JZSP-CSP24-05-E		
	10 m	JZSP-CSP04-10-E	JZSP-CSP24-10-E		
	15 m	JZSP-CSP04-15-E	JZSP-CSP24-15-E		
	20 m	JZSP-CSP04-20-E	JZSP-CSP24-20-E		
Connector Kit to SERVOPACK		JZSP-CMP9-1-E		Soldered 	(5)
Connectors to Encoder for Standard (Connector on Servomotor: MS3102A20-29P)		MS3106B20-29S		Straight Plug 	—
		MS3108B20-29S		L-shaped Plug 	
		MS3057-12A		Cable Clamp 	
Connectors to Encoder for IP67/European Safety Standard (Connector on Servomotor: 97F3102E20-29P)		JA06A-20-29S-J1-EB		Straight Plug 	
		JA08A-20-29S-J1-EB		L-shaped Plug 	
		JL04-2022CKE (09) Cable diameter: 6.5 to 9.5 mm		Cable Clamp 	
		JL04-2022CKE (12) Cable diameter: 9.5 to 13 mm			
		JL04-2022CKE (14) Cable diameter: 12.9 to 15.9 mm			
Cables	5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	20 m Max. 	(6)
	10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E		
	15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E		
	20 m	JZSP-CMP09-20-E	JZSP-CSP39-20-E		

*: Use flexible cables for movable sections such as robot arms.

Selecting Cables

(1) Wiring for Cable with Connectors (For Incremental Encoder)

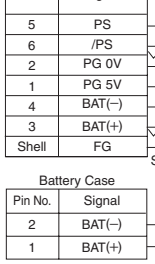


To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Pin No.	Lead Color	
			Standard	Flexible
5	PS	C	Light blue	Red/light blue
6	/PS	D	Light blue/white	Black/light blue
2	PG 0V	G	Black	Green
1	PG 5V	H	Red	Orange
4	BAT(–)	S	Orange/white	Black/pink
3	BAT(+)	T	Orange	Red/pink
Shell	FG	J	FG Shield	FG

Shield Wire

Note: The signals BAT(+) and BAT(–) are used when using an absolute encoder.

(2) Wiring for Cable with Connectors (For Absolute Encoder, with a Battery Case)



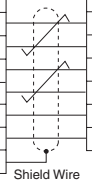
To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Pin No.	Lead Color	
			Standard	Flexible
5	PS	C	Light blue	Red/pink
6	/PS	D	Light blue/white	Black/pink
2	PG 0V	G	Black	Green
1	PG 5V	H	Red	Orange
4	BAT(–)	S	Orange/white	Black/light blue
3	BAT(+)	T	Orange	Red/light blue
Shell	FG	J	FG Shield	FG

Shield Wire

Battery Case

Pin No.	Signal
2	BAT(–)
1	BAT(+)

(3) Wiring for Cable with Loose Wires to Encoder (For Incremental Encoder)

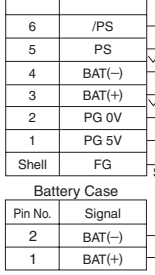


To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Lead Color		Marker
		Standard	Flexible	
6	/PS	Light blue/white	Black/light blue	6
5	PS	Light blue	Red/light blue	5
4	BAT(–)	Orange/white	Black/pink	4
3	BAT(+)	Orange	Red/pink	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

Shield Wire

Notes: 1 The signals BAT(+) and BAT(–) are used when using an absolute encoder.
2 Be sure to connect the shield wire of encoder cable to the connector case (shell).

(4) Wiring for Cable with Loose Wires to Encoder (For Absolute Encoder, with a Battery Case)



To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Lead Color		Marker
		Standard	Flexible	
6	/PS	Light blue/white	Black/pink	6
5	PS	Light blue	Red/pink	5
4	BAT(–)	Orange/white	Black/light blue	4
3	BAT(+)	Orange	Red/light blue	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

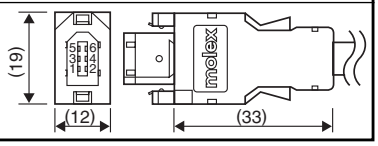
Shield Wire

Battery Case

Pin No.	Signal
2	BAT(–)
1	BAT(+)

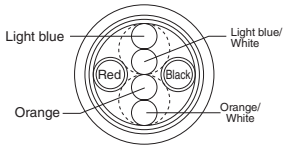
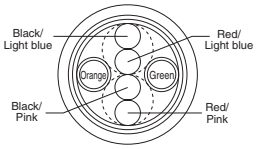
Note: Be sure to connect the shield wire of encoder cable to the connector case (shell).

(5) Connector Kits to SERVOPACK

Items	Specifications
Order No.	JZSP-CMP9-1-E
Manufacturer	Molex Japan Co., Ltd.
Connector Model No. (For Standard)	55100-0670 (soldered)
Dimensional Drawings (Units: mm)	

Note: The mating connector model No. on SERVOPACK: 54280-06□□

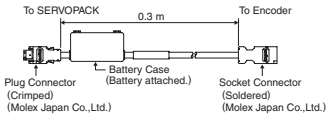
(6) Cables

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CMP09-□□-E	JZSP-CSP39-□□-E
Cable Length	20 m max.	
Specifications	UL20276 (Max. operating temperature: 80°C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.15 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.09 mm	UL20276 (Max. operating temperature: 80°C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.35 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.21 mm
Finished Dimensions	6.5 dia. mm	6.8 dia. mm
Internal Configuration and Lead Color		
Yaskawa Standards Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP09-05-E (5 m)

Selecting Cable

● Encoder Cables and Connectors (For Extending from 30 m up to 50 m)

Name		Length	Order No.	Specifications	Details
① Relay Encoder Cable (for Relay)	For SERVOPACK (For Absolute Encoder, with a Battery Case)	0.3 m	JZSP-CSP12-E*		(1)
② Encoder cable and connector for 50 m extension	Connector to Encoder for Standard (Connector on Servomotor: MS3102A20-29P)		MS3106B20-29S	Straight Plug 	—
			MS3108B20-29S	L-shaped Plug 	
			MS3057-12A	Cable Clamp 	
	Connector to Encoder for IP67/European Safety Standards (Connector on Servomotor: 97F3102E20-29P)		JA06A-20-29S-J1-EB	Straight Plug 	
			JA08A-20-29S-J1-EB	L-shaped Plug 	
			JL04-2022CKE (09) Cable diameter: 6.5 to 9.5 mm	Cable Clamp 	
			JL04-2022CKE (12) Cable diameter: 9.5 to 13 mm		
			JL04-2022CKE (14) Cable diameter: 12.9 to 15.9 mm		
	30 m to 50 m encoder cables are available	30 m	JZSP-CMP19-30-E	50 m Max. 	(2)
		40 m	JZSP-CMP19-40-E		
		50 m	JZSP-CMP19-50-E		

*: Not required if using an incremental encoder or if using an absolute encoder with a battery connected to the host controller.

(1) Wiring for Relay Encoder Cable to SERVOPACK (For Absolute Encoder, with a Battery Case)

To SERVOPACK

Pin No.	Signal
6	/PS
5	PS
4	BAT(–)
3	BAT(+)
2	PG0V
1	PG5V
Shell	FG

Battery Case

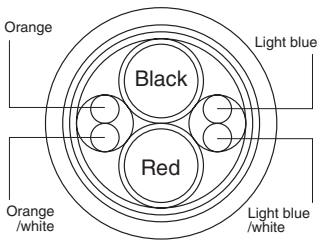
Pin No.	Signal
2	BAT(–)
1	BAT(+)

Shield Wire

To Encoder (Servomotor)

Signal	Lead Color
6	Light blue/white
5	Light blue
4	Orange/white
3	Orange
2	Black
1	Red
Shell	FG

(2) Specification of 50 m encoder cable extension

Items	Standard Cable
Order No.*	JZSP-CMP19-□□-E
Cable Length	50 m max.
Specifications	UL20276 (Max. operating temperature: 80℃) AWG16×2C+AWG26×2P AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.0 mm AWG26 (0.13 mm²) Outer diameter of insulating sheath: 0.91 mm
Finished Dimensions	6.8 dia. mm
Internal Configuration and Lead Colors	
Yaskawa Standard Specifications (Standard Length)	Cable length: 30 m, 40 m, 50 m

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP19-30-E (30 m)

With Standard Backlash Gears | Ratings and Specifications

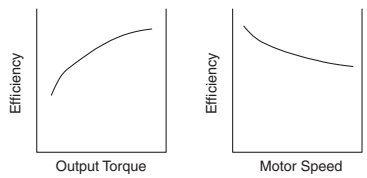
Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0˚C to 40˚C
Mounting: Foot and flange-mounted
Frame Nos. 6090 to 6125: Omni-directional mounting
Frame Nos. 6130 to 6190: Horizontal mounting to shaft
Gear Lubricating Method: Frane Nos. 6090 to 6125: Grease
Frane Nos. 6130 to 6190: Oil
Excitation: Permanent magnet

Thermal Class: F
Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP44 (or the equivalent)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: Roughly 0.6˚ to 2˚ at gear output shaft
Gear Rotation Direction: Reverse direction of servomotor
Gear Mechanism: Cyclo gear mechanism

Note: Contact your Yaskawa representative for more information if the servomotors are to be used for applications with the following characteristics:
・Continuous or frequent stop/start
・Heavy shock loading by acceleration/deceleration

Servomotor Model SGMGH-	Servomotor			Gear Output					Moment of Inertia kg·m²×10⁻⁴	
	Output kW	Rated Speed min⁻¹	Rated Torque N·m	Gear Ratio	Rated Torque/Efficiency* N·m/%	Instantaneous Peak Torque N·m/%	Rated Speed min⁻¹	Max. Speed min⁻¹	Motor + Gear	Gear
03P□B□A6	0.3	1000	2.84	1/6	12.8/75	32.3/75	166	333	9.20	1.96
03P□B□B6				1/11	25.0/80	63.1/80	90	181	8.84	1.6
03P□B□C6				1/21	47.7/80	120/80	47	95	8.39	1.15
03P□B□76				1/29	65.9/80	166/80	34	68	8.41	1.17
06P□B□A6	0.6		5.68	1/6	27.3/80	67.7/80	166	333	15.7	1.78
06P□B□B6				1/11	50.0/80	124/80	90	181	15.3	1.35
06P□B□C6				1/21	95.4/80	237/80	47	95	15.9	1.97
06P□B□76				1/29	132/80	327/80	34	68	16.1	2.19
09P□B□A6	0.9		8.62	1/6	41.4/80	92.6/80	166	333	22.3	1.84
09P□B□B6				1/11	75.9/80	170/80	90	181	21.9	1.41
09P□B□C6				1/21	145/80	324/80	47	95	22.5	2.03
09P□B□76				1/29	200/80	448/80	34	68	22.7	2.24
12P□B□A6	1.2		11.5	1/6	58.7/85	143/85	166	333	38.0	6.3
12P□B□B6				1/11	108/85	262/85	90	181	36.5	4.76
12P□B□C6				1/21	205/85	500/85	47	95	37.6	5.93
12P□B□76				1/29	283/85	690/85	34	68	37.3	5.58
20P□B□A6	2.0		19.1	1/6	97.4/85	224/85	166	333	52.3	6.3
20P□B□B6				1/11	179/85	411/85	90	181	50.8	4.76
20P□B□C6				1/21	341/85	785/85	47	95	51.9	5.93
20P□B□76				1/29	471/85	1080/85	34	68	78.5	32.5
30P□B□A6	3.0		28.4	1/6	145/85	325/85	166	333	79.5	12.0
30P□B□B6				1/11	266/85	596/85	90	181	75.2	7.73
30P□B□C6				1/21	507/85	1140/85	47	95	101	33.6
30P□B□76				1/29	700/85	1570/85	34	68	121	53.3
40P□B□A6	4.0		38.2	1/6	195/85	546/85	166	333	103	13.7
40P□B□B6				1/11	357/85	1000/85	90	181	98.8	9.78
40P□B□C6				1/21	682/85	1910/85	47	95	157	68.0
40P□B□76				1/29	940/85	2640/85	34	68	155	66.0
55P□B□B6	5.5		52.6	1/11	492/85	1280/85	90	181	175	50.2
55P□B□C6				1/21	940/85	2450/85	47	95	193	68.0
55P□B□76				1/29	1297/85	3380/85	34	68	207	81.5

*: Output torque and motor speed produce the following trends in efficiency. Values in the table are at the rated motor speed.



Notes: 1 For oil lubrication, the motor should be mounted horizontal to the shaft. Contact your Yaskawa representative about lubrication for angle mounting.
2 The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

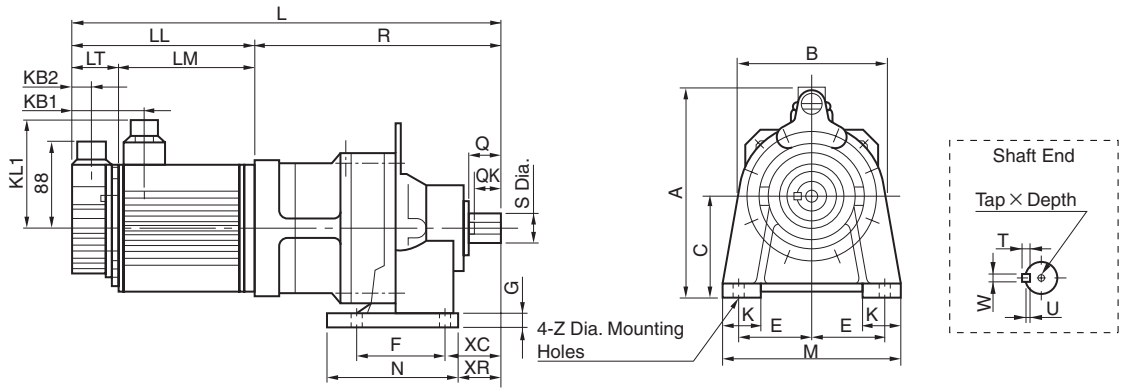
● Allowable Radial Load

Servomotor Model SGMGH-		Allowable Radial Load for Shaft Center (Fr) N
Grease-lubricating Type ・With Foot ・Flange Type	03P□B□A6	2840
	03P□B□B6	3340
	03P□B□C6	5400
	03P□B□76	5400
	06P□B□A6	4120
	06P□B□B6	5230
	06P□B□C6	8260
	06P□B□76	9810
	09P□B□A6	4110
	09P□B□B6	7600
	09P□B□C6	10900
	09P□B□76	11900
	12P□B□A6	5980
	12P□B□B6	7600
	20P□B□A6	5940
	20P□B□B6	7530
Oil-lubricating Type (for Small Capacity and Large Capacity) ・With Foot ・Flange Type	12P□B□C6	10900
	12P□B□76	11900
	20P□B□C6	15700
	20P□B□76	20500
	30P□B□A6	6920
	30P□B□B6	8790
	30P□B□C6	18600
	30P□B□76	23100
	40P□B□A6	6870
	40P□B□B6	13000
	40P□B□C6	21000
	40P□B□76	23000
	55P□B□B6	15000
	55P□B□C6	20900
	55P□B□76	30400

Foot-mounted Type with Standard Backlash Gears | External Dimensions Units: mm

● Without Brakes

(1) Grease Lubricating Type



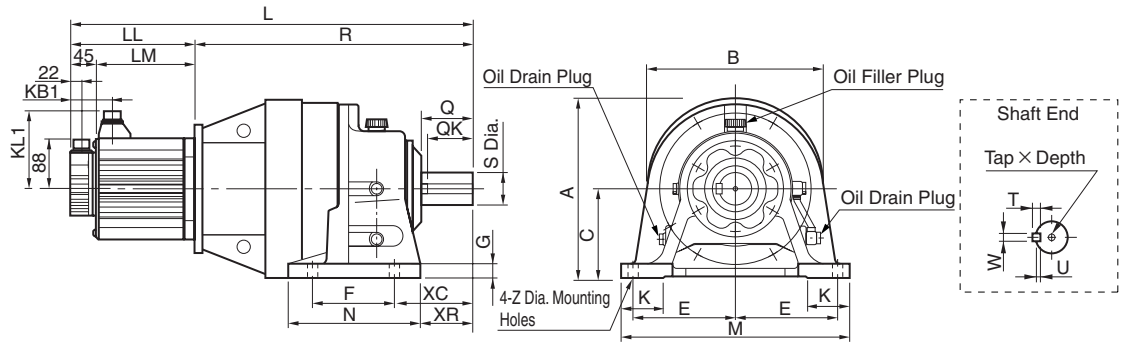
Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	LT	KB1	KB2	KL1	R	A	B	C*
03P□BEA61	CNHX-6090	1/6	380	138	94	44	73	21	109	242	209	152	100
03P□BEB61	CNHX-6090	1/11	380	138	94	44	73	21	109	242	209	152	100
03P□BEC61	CNHX-6100	1/21	394	138	94	44	73	21	109	256	209	152	100
03P□BE761	CNHX-6100	1/29	394	138	94	44	73	21	109	256	209	152	100
06P□BEA61	CNHX-6100	1/6	417	161	117	44	73	21	109	256	209	152	100
06P□BEB61	CNHX-6100	1/11	417	161	117	44	73	21	109	256	209	152	100
06P□BEC61	CNHX-6120	1/21	449	161	117	44	73	21	109	288	257	204	120
06P□BE761	CNHX-6120	1/29	449	161	117	44	73	21	109	288	257	204	120
09P□BEA61	CNHX-6100	1/6	441	185	141	44	73	21	109	256	209	152	100
09P□BEB61	CNHX-6105	1/11	441	185	141	44	73	21	109	256	209	152	100
09P□BEC61	CNHX-6125	1/21	473	185	141	44	73	21	109	288	257	204	120
09P□BE761	CNHX-6125	1/29	473	185	141	44	73	21	109	288	257	204	120
12P□BEA61	CNHX-6120	1/6	477	166	121	45	77	22	140	311	260	204	120
12P□BEB61	CNHX-6120	1/11	477	166	121	45	77	22	140	311	260	204	120
20P□BEA61	CNHX-6120	1/6	503	192	147	45	77	22	140	311	260	204	120
20P□BEB61	CNHX-6125	1/11	503	192	147	45	77	22	140	311	260	204	120

Model SGMGH-	Foot-mounted Dimensions									Shaft-end Dimensions							Approx. Mass kg
	E	F	G	K	M	N	XR	XC	Z	Q	QK	S	T	U	W	Tap×Depth	
03P□BEA61	75	90	12	65	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	20.7
03P□BEB61	75	90	12	65	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	20.7
03P□BEC61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	22.7
03P□BE761	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	22.7
06P□BEA61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	24.6
06P□BEB61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	24.6
06P□BEC61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	34.6
06P□BE761	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	34.6
09P□BEA61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	26.6
09P□BEB61	75	90	12	40	180	135	45	60	11	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	26.6
09P□BEC61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	36.6
09P□BE761	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	36.6
12P□BEA61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	43
12P□BEB61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	43
20P□BEA61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	47
20P□BEB61	95	115	15	55	230	155	62	82	14	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	47

*: The tolerances for all models are 0 to -0.5.

Note: Since grease has been filled prior to shipment, the servomotors can be used without replenishing grease.

(2) Oil Lubricating Type



Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	KB1	KL1	R	A*1	B	C*2
12P□BEC61	CHHX-6130	1/21	536	166	121	77	140	370	300	246	150
12P□BE761	CHHX-6135	1/29	536	166	121	77	140	370	300	246	150
20P□BEC61	CHHX-6140	1/21	582	192	147	77	140	390	300	246	150
20P□BE761	CHHJ-6160	1/29	687	192	147	77	140	495	367	318	160
30P□BEA61	CHHX-6130	1/6	596	226	181	77	140	370	300	246	150
30P□BEB61	CHHX-6135	1/11	596	226	181	77	140	370	300	246	150
30P□BEC61	CHHJ-6160	1/21	721	226	181	77	140	495	367	318	160
30P□BE761	CHHJ-6170	1/29	785	226	181	77	140	559	429	363	200
40P□BEA61	CHHX-6135	1/6	664	260	215	86	150	404	300	246	150
40P□BEB61	CHHX-6145	1/11	684	260	215	86	150	424	300	246	150
40P□BEC61	CHHJ-6170	1/21	853	260	215	86	150	593	429	363	200
40P□BE761	CHHJ-6175	1/29	853	260	215	86	150	593	429	363	200
55P□BEB61	CHHJ-6160	1/11	863	334	289	86	150	529	367	318	160
55P□BEC61	CHHJ-6175	1/21	927	334	289	86	150	593	429	363	200
55P□BE761	CHHJ-6185	1/29	977	334	289	86	150	643	467	393	220

Model SGMGH-	Foot-mounted Dimensions									Shaft-end Dimensions							Approx. Mass kg
	E	F	G	K	M	N	XR	XC	Z	Q	QK	S	T	U	W	Tap×Depth	
12P□BEC61	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	67
12P□BE761	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	67
20P□BEC61	145	145	22	65	330	195	95	120	18	90	80	$50^{0}_{-0.016}$	9	5.5	14	M10×18	72
20P□BE761	185	150	25	75	410	238	95	139	18	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	126
30P□BEA61	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	76
30P□BEB61	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	76
30P□BEC61	185	150	25	75	410	238	95	139	18	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	131
30P□BE761	190	275	30	80	430	335	95	125	22	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	176
40P□BEA61	145	145	22	65	330	195	75	100	18	70	56	$50^{0}_{-0.016}$	9	5.5	14	M10×18	88
40P□BEB61	145	145	22	65	330	195	95	120	18	90	80	$50^{0}_{-0.016}$	9	5.5	14	M10×18	89
40P□BEC61	190	275	30	80	430	335	95	125	22	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	191
40P□BE761	190	275	30	80	430	335	95	125	22	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	191
55P□BEB61	185	150	25	75	410	238	95	139	18	90	80	$60^{0}_{-0.019}$	11	7	18	M10×18	155
55P□BEC61	190	275	30	80	430	335	95	125	22	90	80	$70^{0}_{-0.019}$	12	7.5	20	M12×24	201
55P□BE761	210	320	30	85	470	380	115	145	22	110	100	$80^{0}_{-0.019}$	14	9	22	M12×24	245

*1: Dimensions of hooks are included for some models.
*2: The tolerances for all models are 0 to -0.5.
Note: Oil lubricating type (frame numbers: 6130 to 6190)
Servomotors of this type have been shipped with oil removed. Be sure to add oil until the red line at the upper side of the oil gauge.
Lubrication oil recommended is industrial-use extreme-pressure gear oil of SP-system, JIS K 2219 industrial-use gear oil or equivalent. Refer to the following table.

Surrounding Air Temperature	Manufacturer						
	COSMO Oil Co., Ltd.	Nippon Oil Co., Ltd.	Idemitsu Oil & Gas Co., Ltd.	Showa Shell Sekiyu K.K.	Exxon Mobil Corporation.		JAPAN ENERGY CORPORATION
0˚C to 35˚C	COSMO Gear SE 100, 150	BON-NOCK M 100, 150	Daphne Super Gear Oil 100, 150	Shell Omala Oil 100, 150	Spartan EP 100, 150	Mobil Gear 627, 629 (ISO VG100, 150)	JOMO Reductus 100,150

The following shows the approximate amount of oil to be added.

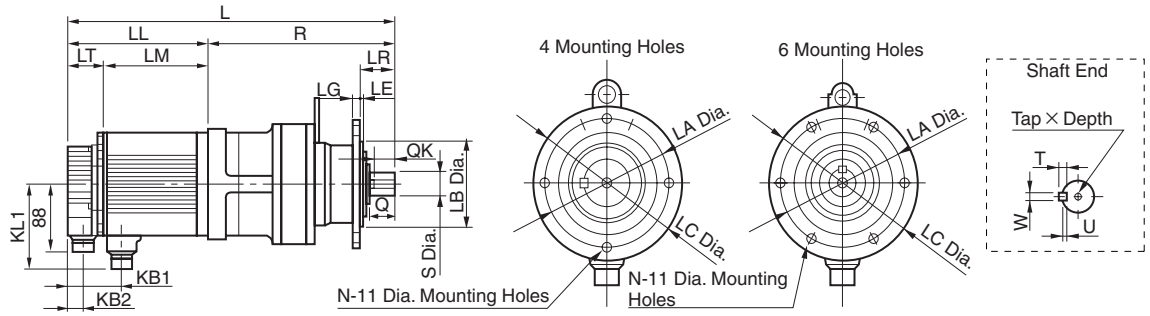
Units: liter

Frame No.	6130 6135	6140	6160	6170 6175	6180 6185	6190
Horizontal Type	0.7	0.7	1.4	1.9	2.5	4.0

Flange-mounted Type with Standard Backlash Gears | External Dimensions Units: mm

● Without Brakes

(1) Grease Lubricating Type

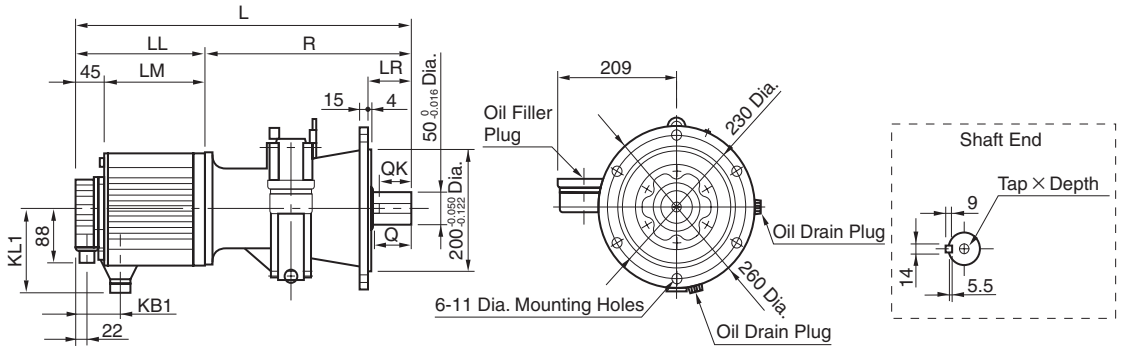


Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	LT	KB1	KB2	KL1	R
03P□BFA61	CNVX-6090	1/6	380	138	94	44	73	21	109	242
03P□BFB61	CNVX-6090	1/11	380	138	94	44	73	21	109	242
03P□BFC61	CNVX-6100	1/21	394	138	94	44	73	21	109	256
03P□BF761	CNVX-6100	1/29	394	138	94	44	73	21	109	256
06P□BFA61	CNVX-6100	1/6	417	161	117	44	73	21	109	256
06P□BFB61	CNVX-6100	1/11	417	161	117	44	73	21	109	256
06P□BFC61	CNVX-6120	1/21	449	161	117	44	73	21	109	288
06P□BF761	CNVX-6120	1/29	449	161	117	44	73	21	109	288
09P□BFA61	CNVX-6100	1/6	441	185	141	44	73	21	109	256
09P□BFB61	CNVX-6105	1/11	441	185	141	44	73	21	109	256
09P□BFC61	CNVX-6125	1/21	473	185	141	44	73	21	109	288
09P□BF761	CNVX-6125	1/29	473	185	141	44	73	21	109	288
12P□BFA61	CNVX-6120	1/6	477	166	121	45	77	22	140	311
12P□BFB61	CNVX-6120	1/11	477	166	121	45	77	22	140	311
20P□BFA61	CNVX-6120	1/6	503	192	147	45	77	22	140	311
20P□BFB61	CNVX-6125	1/11	503	192	147	45	77	22	140	311

Model SGMGH-	Flange Face Dimensions										Shaft-end Dimensions				Approx. Mass kg
	LA	LB	LC	LE	LG	LR	N	Q	QK	S	T	U	W	Tap×Depth	
03P□BFA61	134	$110^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	18.7
03P□BFB61	134	$110^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	18.7
03P□BFC61	134	$110^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	20.7
03P□BF761	134	$110^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	20.7
06P□BFA61	134	$110^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	22.6
06P□BFB61	134	$110^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	22.6
06P□BFC61	180	$140^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	33.6
06P□BF761	180	$140^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	33.6
09P□BFA61	134	$110^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	24.6
09P□BFB61	134	$110^{-0.036}_{-0.090}$	160	3	9	48	4	35	32	$28^{0}_{-0.013}$	7	4	8	M8×20	24.6
09P□BFC61	180	$140^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	35.6
09P□BF761	180	$140^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	35.6
12P□BFA61	180	$140^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	42
12P□BFB61	180	$140^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	42
20P□BFA61	180	$140^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	46
20P□BFB61	180	$140^{-0.043}_{-0.106}$	210	4	13	69	6	55	50	$38^{0}_{-0.016}$	8	5	10	M8×20	46

Note: Grease lubricating type (frame numbers: 6090 to 6125)
Since grease has been filled prior to shipment, the servomotors can be used without replenishing grease.

(2) Small Oil Lubricating Type



Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	KB	KL1	R	Flange Face Dimensions	Shaft-end Dimensions			Approx. Mass kg
									LR	Q	QK	Tap×Depth	
12P□BFC61	CHVX-6130	1/21	536	166	121	77	140	370	76	70	56	M10×18	66
12P□BF761	CHVX-6135	1/29	536	166	121	77	140	370	76	70	56	M10×18	66
20P□BFC61	CHVX-6140	1/21	582	192	147	77	140	390	96	90	80	M10×18	71
30P□BFA61	CHVX-6130	1/6	596	226	181	77	140	370	76	70	56	M10×18	75
30P□BFB61	CHVX-6135	1/11	596	226	181	77	140	370	76	70	56	M10×18	75
40P□BFA61	CHVX-6135	1/6	664	260	215	86	150	404	76	70	56	M10×18	87
40P□BFB61	CHVX-6145	1/11	684	260	215	86	150	424	96	90	80	M10×18	88

Note: Oil lubricating type (frame numbers: 6130 to 6190)
Servomotors of this type have been shipped with oil removed. Be sure to add oil until the red line at the upper side of the oil gauge.
Lubrication oil recommended is industrial-use extreme-pressure gear oil of SP-system, JIS K 2219 industrial-use gear oil or equivalent. Refer to the following table.

Surrounding Air Temperature	Manufacturer						
	COSMO Oil Co., Ltd.	Nippon Oil Co., Ltd.	Idemitsu Oil & Gas Co., Ltd.	Showa Shell Sekiyu K.K.	Exxon Mobil Corporation.		JAPAN ENERGY CORPORATION
0°C to 35°C	COSMO Gear SE 100, 150	BON-NOCK M 100, 150	Daphne Super Gear Oil 100, 150	Shell Omala Oil 100, 150	Spartan EP 100, 150	Mobil Gear 627, 629 (ISO VG100, 150)	JOMO Reductus 100,150

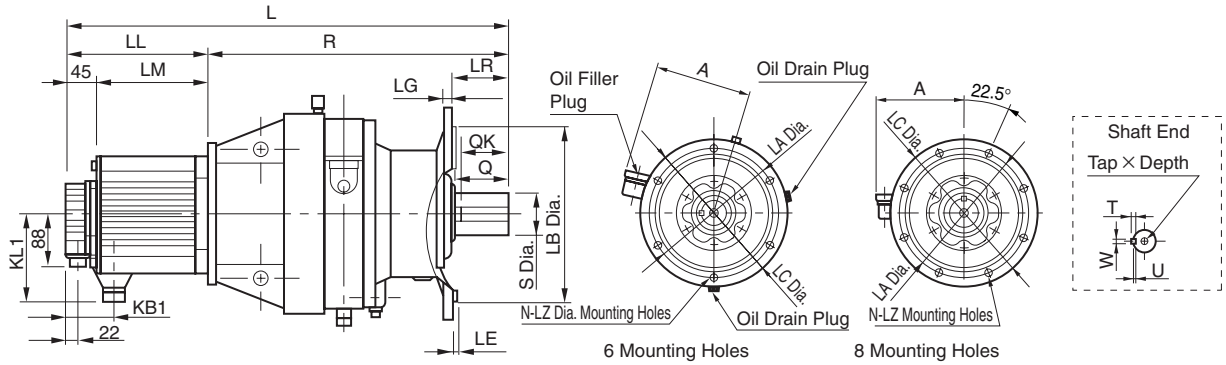
The following shows the approximate amount of oil to be added.

Units: liter

Frame No.	6130 6135	6140	6160	6170 6175	6180 6185	6190
Horizontal Type	0.7	0.7	1.4	1.9	2.5	4.0

Flange-mounted Type with Standard Backlash Gears | External Dimensions Units: mm

(3) Large Oil Lubricating Type



Model SGMGH-	Gear Model	Gear Ratio	L	LL	LM	KB1	KL1	R	A
20P□BF761	CHVJ-6160	1/29	687	192	147	77	140	495	228
30P□BFC61	CHVJ-6160	1/21	721	226	181	77	140	495	228
30P□BF761	CHVJ-6170	1/29	785	226	181	77	140	559	243
40P□BFC61	CHVJ-6170	1/21	853	260	215	86	150	593	243
40P□BF761	CHVJ-6175	1/29	853	260	215	86	150	593	243
55P□BFB61	CHVJ-6160	1/11	863	334	289	86	150	529	228
55P□BFC61	CHVJ-6175	1/21	927	334	289	86	150	593	243
55P□BF761	CHVJ-6185	1/29	977	334	289	86	150	643	258

Model SGMGH-	Flange Face Dimensions								Shaft-end Dimensions							Approx. Mass kg
	LA	LB	LC	LE	LG	LR	N	LZ	Q	QK	S	T	U	W	Tap×Depth	
20P□BF761	310	270 $^{-0.056}_{-0.137}$	340	4	20	89	6	11	90	80	60 $^{0}_{-0.019}$	11	7	18	M10×18	121
30P□BFC61	310	270 $^{-0.056}_{-0.137}$	340	4	20	89	6	11	90	80	60 $^{0}_{-0.019}$	11	7	18	M10×18	126
30P□BF761	360	316 $^{-0.062}_{-0.151}$	400	5	22	94	8	14	90	80	70 $^{0}_{-0.019}$	12	7.5	20	M12×24	176
40P□BFC61	360	316 $^{-0.062}_{-0.151}$	400	5	22	94	8	14	90	80	70 $^{0}_{-0.019}$	12	7.5	20	M12×24	191
40P□BF761	360	316 $^{-0.062}_{-0.151}$	400	5	22	94	8	14	90	80	70 $^{0}_{-0.019}$	12	7.5	20	M12×24	191
55P□BFB61	310	270 $^{-0.056}_{-0.137}$	340	4	20	89	6	11	90	80	60 $^{0}_{-0.019}$	11	7	18	M10×18	150
55P□BFC61	360	316 $^{-0.062}_{-0.151}$	400	5	22	94	8	14	90	80	70 $^{0}_{-0.019}$	12	7.5	20	M12×24	201
55P□BF761	390	345 $^{-0.062}_{-0.151}$	430	5	22	110	8	18	110	100	80 $^{0}_{-0.019}$	14	9	22	M12×24	232

Noto: Oil lubricating type (frame numbers: 6130 to 6190)
Servomotors of this type have been shipped with oil removed. Be sure to add oil until the red line at the upper side of the oil gauge.
Lubrication oil recommended is industrial-use extreme-pressure gear oil of SP-system, JIS K 2219 industrial-use gear oil or equivalent. Refer to the following table.

Surrounding Air Temperature	Manufacturer						
	COSMO Oil Co., Ltd.	Nippon Oil Co., Ltd.	Idemitsu Oil & Gas Co., Ltd.	Showa Shell Sekiyu K.K.	Exxon Mobil Corporation.		JAPAN ENERGY CORPORATION
0°C to 35°C	COSMO Gear SE 100, 150	BON-NOCK M 100, 150	Daphne Super Gear Oil 100, 150	Shell Omala Oil 100, 150	Spartan EP 100, 150	Mobil Gear 627, 629 (ISO VG100, 150)	JOMO Reductus 100,150

The following shows the approximate amount of oil to be added.

Units: liter

Frame No.	6130 6135	6140	6160	6170 6175	6180 6185	6190
Horizontal Type	0.7	0.7	1.4	1.9	2.5	4.0

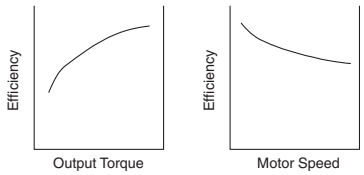
With Low-backlash Gears | Ratings and Specifications

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0˚C to 40˚C
Excitation: Permanent magnet
Mounting: Flange method (Omni-directional mounting)
Gear Lubicating Methed: Grease
Gear Mechanism: Planetary gear mechanism
Thermal Class: F

Withstand Voltage: 200 V Servomotors: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP44 (or the equivalent)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Backlash: 0.05°(3 min) at the gear output shaft
Gear Rotation Direction: Same direction as servomotor

Servomotor Model SGMGH-	Servomotor			Gear Output					Moment of Inertia kg·m²×10⁻⁴	
	Output kW	Rated Speed min⁻¹	Rated Torque N·m	Gear Ratio	Rated Torque/Efficiency* N·m/%	Instantaneous Peak Torque N·m/%	Rated Speed min⁻¹	Max. Speed min⁻¹	Motor + Gear	Gear
03A□BL14	0.3	1000	2.84	1/5	11.4/80	28.7/80	200	400	8.50	1.26
03A□BL24				1/9	20.4/80	51.6/80	111	222	8.18	0.96
03A□BL54				1/20	45.4/80	115/80	50	100	8.64	1.40
03A□BL74				1/29	65.9/80	166/80	34	68	10.0	2.76
03A□BL84				1/45	102/80	258/80	22	44	9.05	1.81
06A□BL14	0.6		5.68	1/5	22.7/80	56.4/80	200	400	15.2	1.30
06A□BL24				1/9	40.9/80	101/80	111	222	14.8	0.90
06A□BL54				1/20	90.9/80	226/80	50	100	18.6	4.70
06A□BL74				1/29	132/80	327/80	34	68	16.7	2.80
06A□BL84				1/45	204/80	508/80	22	44	18.4	4.50
09A□BL14	0.9		8.62	1/5	34.5/80	77.2/80	200	400	23.9	3.40
09A□BL24				1/9	62.1/80	139/80	111	222	25.3	4.80
09A□BL54				1/20	138/80	309/80	50	100	27.4	6.90
09A□BL74				1/29	200/80	448/80	34	68	30.9	10.4
09A□BL84				1/45	310/80	695/80	22	44	27.2	6.70
12A□BL14	1.2		11.5	1/5	46/80	112/80	200	400	41.9	10.2
12A□BL24				1/9	82.8/80	202/80	111	222	39.5	7.80
12A□BL54				1/20	184/80	448/80	50	100	51.9	20.2
12A□BL74				1/29	267/80	650/80	34	68	45.1	13.4
12A□BL84				1/45	414/80	1008/80	22	44	41.4	9.70
20A□BL14	2.0		19.1	1/5	76.4/80	176/80	200	400	56.2	10.2
20A□BL24				1/9	138/80	317/80	111	222	53.8	7.80
20A□BL54				1/20	306/80	704/80	50	100	66.2	20.2
30A□BL14	3.0		28.4	1/5	114/80	255/80	200	400	87.9	20.4
30A□BL24				1/9	204/80	459/80	111	222	80.0	12.5

*: Output torque and motor speed produce the following trends in efficiency. Values in the table are at the rated motor speed.



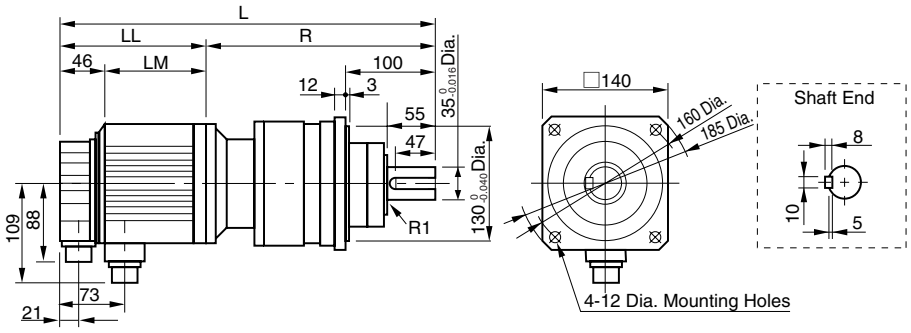
Note: The no-load torque for a servomotor with a gear is high immediately after the servomotor starts, and it then decreases and becomes stable a few minutes later. This is a common phenomenon caused by grease being circulated in the gear and not by a faulty gear.

With Low-backlash Gears | Ratings and Specifications

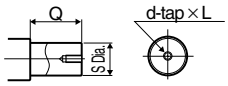
● Allowable Radial Load

Servomotor Model SGMGH-		Allowable Radial Load for Shaft Center (Fr) N
Grease-lubricating Type (For Small Capacity) ・Flange Type	03A□BL14	833
	03A□BL24	980
	03A□BL54	1270
	06A□BL14	833
	06A□BL24	980
	09A□BL14	833
Grease-lubricating Type (For Large Capacity) ・Flange Type	03A□BL74	2940
	03A□BL84	3430
	06A□BL54	2650
	06A□BL74	2940
	06A□BL84	8040
	09A□BL24	1960
	09A□BL54	2650
	09A□BL74	6860
	09A□BL84	8040
	12A□BL14	1670
	12A□BL24	1960
	12A□BL54	6080
	12A□BL74	6860
	12A□BL84	8040
	20A□BL14	1670
	20A□BL24	1960
	20A□BL54	6080
	30A□BL14	3820
	30A□BL24	4700

● Small Grease Lubricating Type



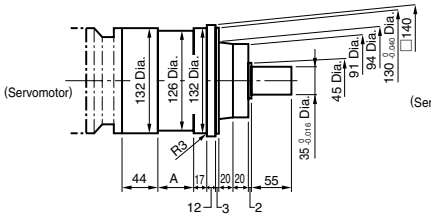
● Applied Specifications for Shaft-end Tap



Frame No.	Dia. S	Length Q	d × L mm
ANFJ-L20	35	55	M8 × 16
ANFJ-L30	50	75	M10 × 20
ANFJ-L40	60	90	M12 × 24

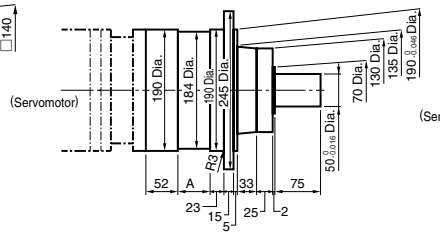
● Detailed Dimensions of Gears

ANFJ-L20



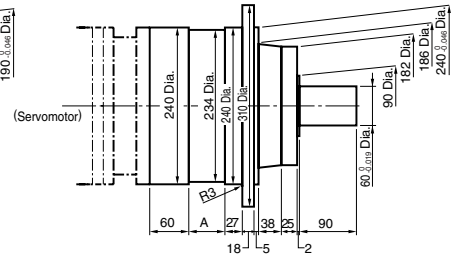
Gear Ratio	A
1/5	6
1/9	18
1/20, 1/29	37
1/45	47

ANFJ-L30



Gear Ratio	A
1/5	11
1/9	38
1/20, 1/29	42
1/45	52

ANFJ-L40



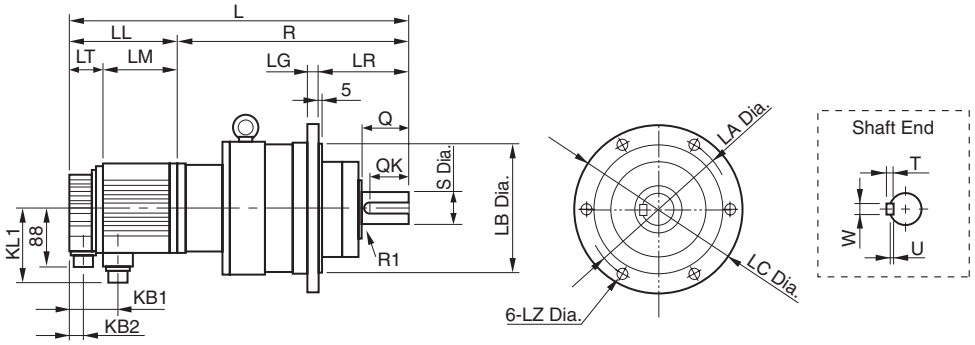
Gear Ratio	A
1/5	16
1/9	48
1/20, 1/29	48
1/45	58

Model SGMGH-	Gear Model No.	Gear Ratio	L	LL	LM	R	Approx. Mass kg
03A□BL141	ANFJ-L20	1/5	394	138	92	256	14
03A□BL241		1/9	406	138	92	268	14
03A□BL541		1/20	425	138	92	287	16
06A□BL141		1/5	417	161	115	256	16
06A□BL241		1/9	429	161	115	268	16
09A□BL141		1/5	441	185	139	256	18

Note: Since grease has been filled prior to shipment, the servomotors can be used without replenishing grease.

With Low-backlash Gears | External Dimensions Units: mm

● Large Grease Lubricating Type

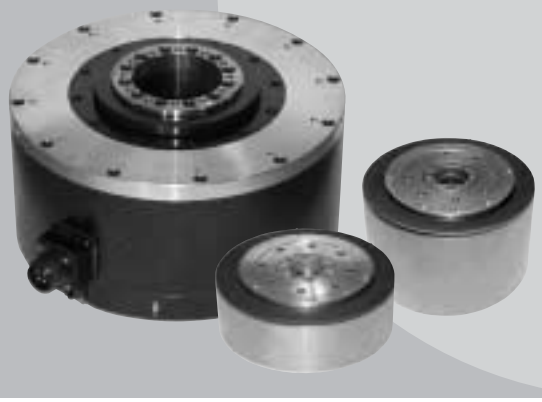


Model SGMGH-	Gear Model No.	Gear Ratio	L	LL	LM	LR	LT	KB1	KB2	KL1	R	Flange Face Dimensions					Shaft-end Dimensions						Approx. Mass kg
												LA	LB	LC	LG	LZ	Q	QK	S	T	U	W	
03A□BL741	ANFJ-L30	1/29	491	138	92	140	46	73	21	109	353	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	31
03A□BL841		1/45	501	138	92	140	46	73	21	109	363	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	31
06A□BL541		1/20	514	161	115	140	46	73	21	109	353	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	33
06A□BL741		1/29	514	161	115	140	46	73	21	109	353	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	33
06A□BL841	ANFJ-L40	1/45	565	161	115	160	46	73	21	109	404	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	53
09A□BL241	ANFJ-L30	1/9	534	185	139	140	46	73	21	109	349	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	35
09A□BL541		1/20	538	185	139	140	46	73	21	109	353	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	35
09A□BL741	ANFJ-L40	1/29	579	185	139	160	46	73	21	109	394	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	55
09A□BL841		1/45	589	185	139	160	46	73	21	109	404	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	55
12A□BL141	ANFJ-L30	1/5	509	166	119	140	47	77	22	140	343	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	32
12A□BL241		1/9	536	166	119	140	47	77	22	140	370	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	39
12A□BL541	ANFJ-L40	1/20	581	166	119	160	47	77	22	140	415	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	59
12A□BL741		1/29	581	166	119	160	47	77	22	140	415	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	59
12A□BL841		1/45	591	166	119	160	47	77	22	140	425	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	59
20A□BL141	ANFJ-L30	1/5	535	192	145	140	47	77	22	140	343	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	36
20A□BL241		1/9	562	192	145	140	47	77	22	140	370	220	$190^{0}_{-0.046}$	245	15	12	75	65	$50^{0}_{-0.016}$	9	5.5	14	43
20A□BL541	ANFJ-L40	1/20	607	192	145	160	47	77	22	140	415	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	63
30A□BL141		1/5	609	226	179	160	47	77	22	140	383	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	58
30A□BL241		1/9	641	226	179	160	47	77	22	140	415	280	$240^{0}_{-0.046}$	310	18	14	90	78	$60^{0}_{-0.019}$	11	7	18	68

Note: Since grease has been filled prior to shipment, the servomotors can be used without replenishing grease.

Direct-drive Servomotors

SGMCS



Model Designation

SGMCS - 02 B 3 C 1 1

Direct-drive SGMCS servomotor

1st+2nd digits | 3rd digit | 4th digit | 5th digit | 6th digit | 7th digit

1st + 2nd digits Rated Torque

●Small-capacity

Code	Specifications
02	2.0 N·m
04	4.0 N·m
05	5.0 N·m
07	7.0 N·m
08	8.0 N·m
10	10 N·m
14	14 N·m
16	16 N·m
17	17 N·m
25	25 N·m
35	35 N·m

●Medium-capacity

Code	Specifications
45	45 N·m
80	80 N·m
1A	110 N·m
1E	150 N·m
2Z	200 N·m

3rd digit Motor Outer Diameter

Code	Specifications
B	135 dia. mm
C	175 dia. mm
D	230 dia. mm
E	290 dia. mm
M	280 dia. mm
N	360 dia. mm

4th digit Encoder Specifications

Code	Specifications
3	20-bit absolute encoder (Without multiturn data) (standard)
D	20-bit incremental encoder (optional)

5th digit Design Revision Order

Code	Specifications
A	Model of servomotor outer diameter code M, N
B	Model of servomotor outer diameter code E
C	Model of servomotor outer diameter code B, C, D

6th digit Flange Specifications

Code	Flange Specifications		Motor Outer Diameter Code (3rd digit)					
	Specifications	Mounted Side	B	C	D	E	M	N
1	C face	Non-load side	○	○	○	○	–	–
		load end	–	–	–	–	○	○
3	C face	Non-load side	–	–	–	–	○	○
4	C face	Non-load side (with cable on side)	○	○	○	○	–	–

○ : Applicable Model

7th digit Option

Code	Specifications
1	Without options

Features

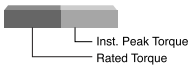
- Directly coupled to a load without a mechanical transmission such as a gear.
- Powerful and smooth operation throughout the speed range from low to high.
  (Instantaneous peak torque: 6 N·m to 600 N·m
  Maximum speed: 250 min^{-1} to 500 min^{-1})
- High-resolution, 20-bit encoder for highly precise indexing.
- Easy wiring and piping with the hollow structure.

Application Examples

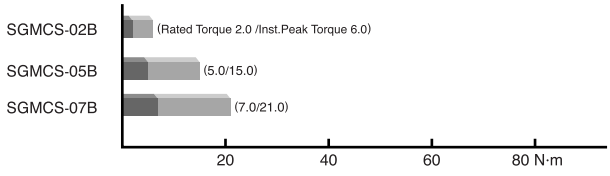
- Semiconductor equipment
- LCD manufacturing equipment
- Units for inspection and testing
- Electronic parts assembling machines
- IC handlers
- Inspection units for integrated circuits
- Automated machines
- Robots

Rated Torque/Peak Torque

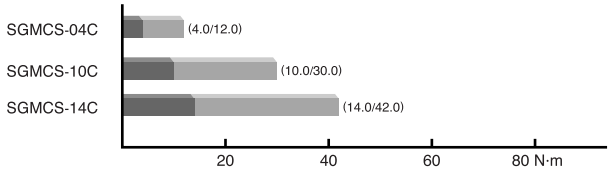
● Small-capacity



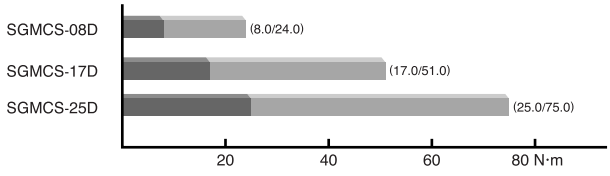
Outer Diameter: 135 mm, Inner Diameter: 20 mm



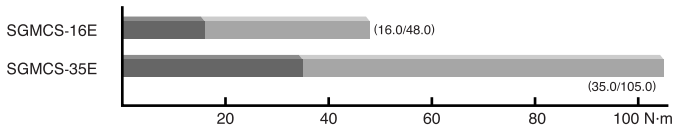
Outer Diameter: 175 mm, Inner Diameter: 35 mm



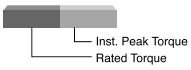
Outer Diameter: 230 mm, Inner Diameter: 60 mm



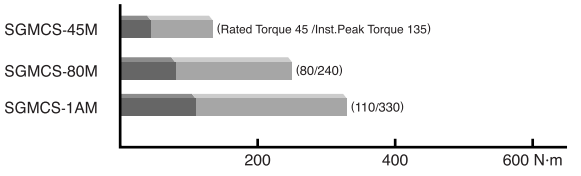
Outer Diameter: 290 mm, Inner Diameter: 75 mm



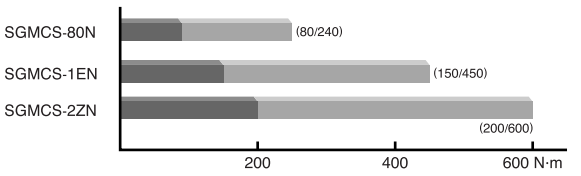
● Medium-capacity



Outer Diameter: 280 mm, Inner Diameter: 75 mm



Outer Diameter: 360 mm, Inner Diameter: 118 mm



Ratings and Specifications

● Small-capacity Series

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0˚C to 40˚C
Excitation: Permanent magnet
Mounting: Flange method
Thermal Class: A

Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP42
(except for gaps on the rotating section of the shaft)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Rotation Direction: Counterclockwise (CCW) with forward run reference when viewed from the load side

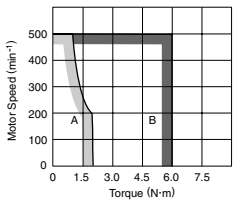
Voltage		200 V										
Servomotor Model SGMCS-□□□□□		02B□C	05B□C	07B□C	04C□C	10C□C	14C□C	08D□C	17D□C	25D□C	16E□B	35E□B
Rated Output*1	W	42	105	147	84	209	293	168	356	393	335	550
Rated Torque*1,*2	N·m	2.0	5.0	7.0	4.0	10.0	14.0	8.0	17.0	25.0	16.0	35.0
Instantaneous Peak Torque*1	N·m	6.0	15.0	21.0	12.0	30.0	42.0	24.0	51.0	75.0	48.0	105
Stall Torque*1	N·m	2.05	5.15	7.32	4.09	10.1	14.2	8.23	17.4	25.4	16.5	35.6
Rated Current*1	Arms	1.8	1.7	1.4	2.2	2.2	2.8	1.9	2.5	2.6	3.3	3.5
Instantaneous Max. Current*1	Arms	5.4	5.1	4.1	7.0	7.0	8.3	5.6	7.5	8.0	9.4	10.0
Rated Speed*1	min^{-1}	200			200			200		150	200	150
Max. Speed*1	min^{-1}	500			500	400	300	500	350	250	500	250
Torque Constant	N·m/Arms	1.18	3.17	5.44	2.04	5.05	5.39	5.1	7.8	10.8	5.58	11.1
Rotor Moment of Inertia	$\times 10^{-4}$ kg·m^2	28	51	77	77	140	220	285	510	750	930	1430
Rated Power Rate*1	kW/s	1.4	4.9	6.4	2.1	7.1	8.9	2.2	5.7	8.3	2.75	8.57
Rated Angular Acceleration*1	rad/s^2	710	980	910	520	710	640	280	330	330	170	240
Absolute Accuracy	second	±15			±15			±15			±15	
Repeatability	second	±1.3			±1.3			±1.3			±1.3	
Applicable SERVOPACK	SGDS-	02			04			04			08	

*1: These items and torque-motor speed characteristics quoted in combination with an SGDS SERVOPACK are at an armature winding temperature of 100˚C. Other values quoted at 20˚C.
*2: Rated torques are continuous allowable torque values at 40˚C with a steel heat sink attached.
Heat Sink: SGMCS-□□B : 350×350×12 mm SGMCS-□□C : 450×450×12 mm
SGMCS-□□D : 550×550×12 mm SGMCS-□□E : 650×650×12 mm
Notes: 1 SGMCS servomotors with holding brakes are not available.
2 For the bearings used in SGMCS servomotors, loss varies according to the bearing temperature. At low temperatures, the amount of heat loss will be large.

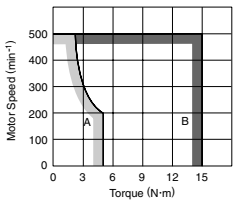
● Small-capacity Series: Torque-motor Speed Characteristics

A Continuous Duty Zone B Intermittent Duty Zone

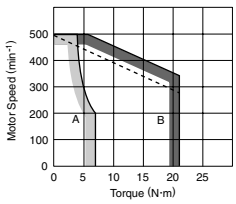
SGMCS-02B



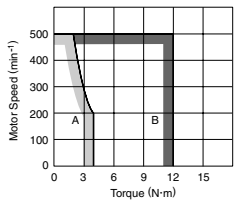
SGMCS-05B



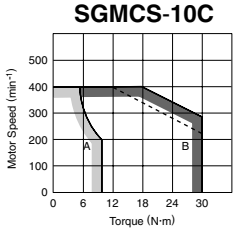
SGMCS-07B



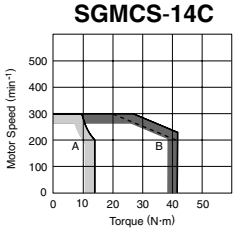
SGMCS-04C



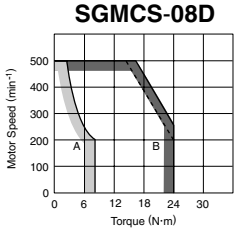
SGMCS-10C



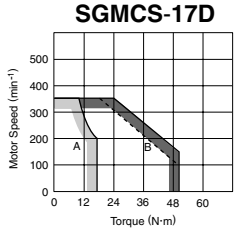
SGMCS-14C



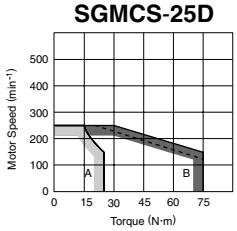
SGMCS-08D



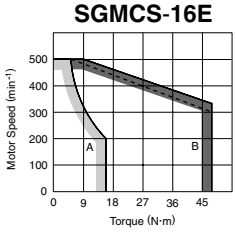
SGMCS-17D



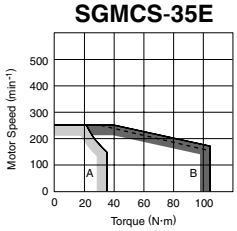
SGMCS-25D



SGMCS-16E



SGMCS-35E

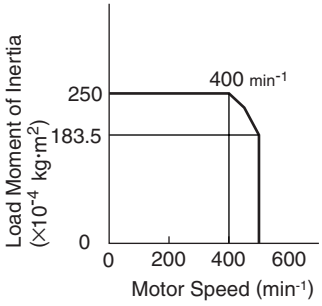


Note: The dotted line of the intermittent duty zone indicates the characteristics when a servomotor runs in combination with a SERVOPACK for 100 VAC.

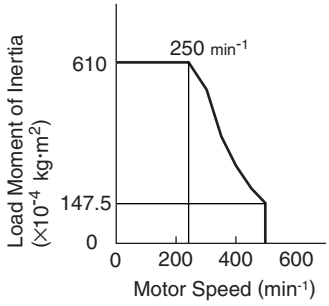
Ratings and Specifications

● Small-capacity Series: Load Moment of Inertia and Motor Speed

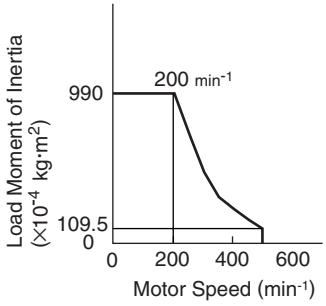
SGMCS-02B (42 W)



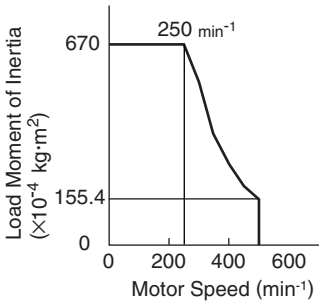
SGMCS-05B (105 W)



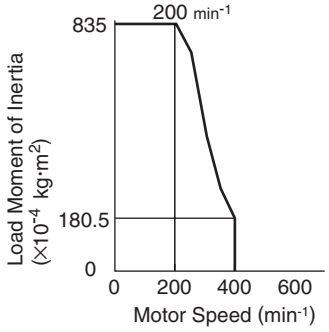
SGMCS-07B (147 W)



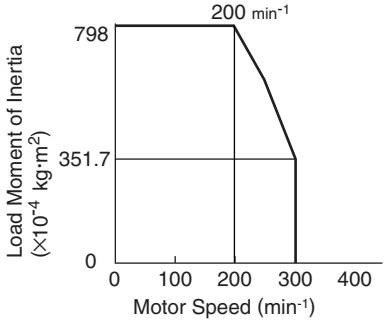
SGMCS-04C (84 W)



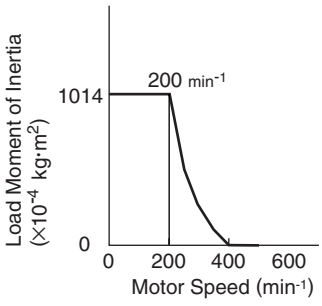
SGMCS-10C (209 W)



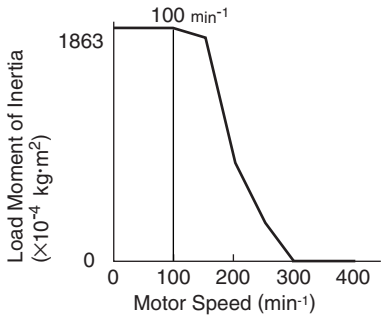
SGMCS-14C (293 W)



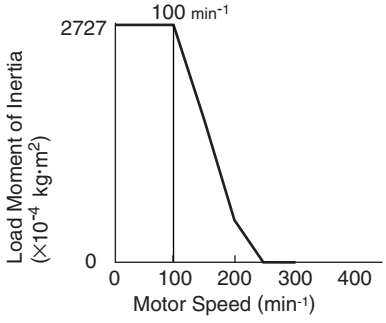
SGMCS-08D (168 W)



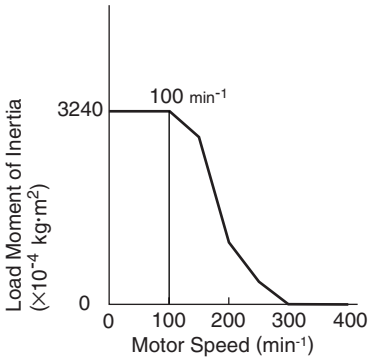
SGMCS-17D (356 W)



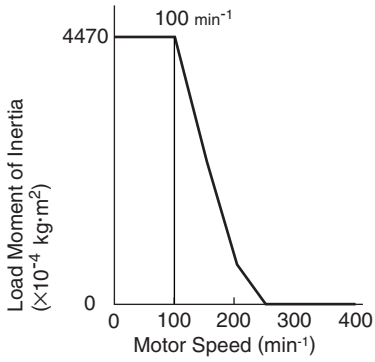
SGMCS-25D (393 W)



SGMCS-16E (335 W)



SGMCS-35E (550 W)



● Small-capacity Series: Allowable Load Moment of Inertia at the Motor Shaft

Servomotor Model	Rated Torque N·m	Allowable Load Moment of Inertia (Rotor Moment of Inertia)
SGMCS	2.0, 4.0, 5.0, 7.0	×10
	10.0	×5
	8.0, 14.0, 16.0, 17.0, 25.0, 35.0	×3

Ratings and Specifications

● Medium-capacity Series

Time Rating: Continuous
Vibration Class: 15 μm or below
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet
Mounting: Flange method
Thermal Class: F

Withstand Voltage: 1500 VAC for one minute
Enclosure: Totally enclosed, self-cooled, IP44 (except for shaft opening)
Ambient Humidity: 20% to 80% (no condensation)
Drive Method: Direct drive
Rotation Direction: Counterclockwise (CCW) with forward run reference when viewed from the load side

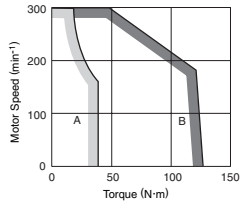
Voltage		200 V					
Servomotor Model SGMCS-□□□□□		45M□A	80M□A	1AM□A	80N□A	1EN□A	2ZN□A
Rated Output*1	W	707	1260	1730	1260	2360	3140
Rated Torque*1,*2	N·m	45	80	110	80	150	200
Instantaneous Peak Torque*1	N·m	135	240	330	240	450	600
Stall Torque*1	N·m	45	80	110	80	150	200
Rated Current*1	Arms	5.80	9.74	13.4	9.35	17.4	18.9
Instantaneous Max. Current*1	Arms	17	28	42	28	56	56
Rated Speed*1	min^{-1}	150					
Max. Speed*1	min^{-1}	300				250	
Torque Constant	N·m/Arms	8.39	8.91	8.45	9.08	9.05	11.5
Rotor Moment of Inertia	$\times 10^{-4}$ kg·m^2	388	627	865	1360	2470	3060
Rated Power Rate*1	kW/s	52.2	102	140	47.1	91.1	131
Rated Angular Acceleration*1	rad/s^2	1160	1280	1270	588	607	654
Applicable SERVOPACK	SGDS-	10	15	20	15	30	30

*1: These items and torque-motor speed characteristics quoted in combination with an SGDS SERVOPACK are at an armature winding temperature of 20℃.
*2: Rated torques are continuous allowable torque values at 40℃ with a steel heat sink (750×750×45 mm) attached.
Notes: 1 SGMCS servomotors with holding brakes are not available.
2 For the bearings used in SGMCS servomotors, loss varies according to the bearing temperature. At low temperatures, the amount of heat loss will be large.

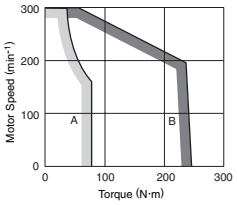
● Medium-capacity Series: Torque-motor Speed Characteristics

A Continuous Duty Zone B Intermittent Duty Zone

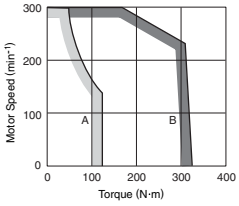
SGMCS-45M



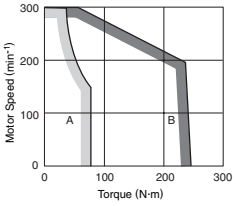
SGMCS-80M



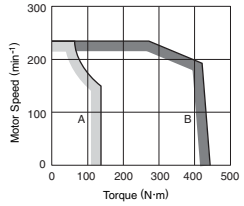
SGMCS-1AM



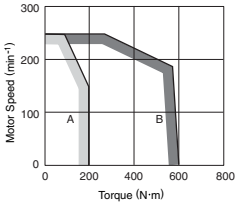
SGMCS-80N



SGMCS-1EN



SGMCS-2ZN



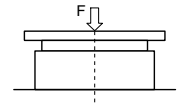
● Medium-capacity Series: Allowable Load Moment of Inertia at the Motor Shaft

Servomotor Model	Rated Torque N·m	Allowable Load Moment of Inertia (Rotor Moment of Inertia)
SGMCS	45	×3
	80	×3
	110	×3
	150	×3
	200	×3

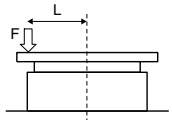
Mechanical Specifications

● Allowable Loads

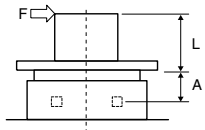
The loads applied while a servomotor is running are roughly classified in the following patterns. Design the machine so that the thrust load and moment load will not exceed the values in the table.



Where F is external force,
Thrust load: Fa=F+Load mass
Moment load: M=0



Where F is external force,
Thrust load: Fa=F+Load mass
Moment load: M=F×L



Where F is external force,
Thrust load: Fa=Load mass
Moment load: M=F×(L+A)

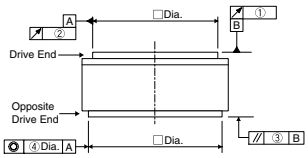
Servomotor Model SGMCS-	02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E	45M	80M	1AM	80N	1EN	2ZN
Dimension A mm	0			0			0			0		33			37.5		
Allowable Thrust Load Fa (N)	1500			3300			4000			11000		9000			16000		
Allowable Moment Load M (N·m)	40	50	64	70	75	90	93	103	135	250	320	180			350		

Note: For small-capacity series SGMCS-02B to -35E servomotors, set the dimension A to 0 (zero).

● Mechanical Tolerance

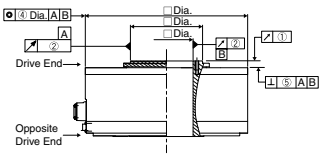
The following table shows tolerances for the servomotor's output shaft and installation area. See the dimensional drawing of the individual servomotor for more details on tolerances.

(1) Small-capacity Series



Tolerance T.I.R.(Total Indicator Reading) Units: mm	Servomotor Model SGMCS-										
	02B	05B	07B	04C	10C	14C	08D	17D	25D	16E	35E
① Run-out of the Surface of the Shaft	0.02			0.02			0.02			0.02	
② Run-out at the End of the Shaft	0.04			0.04			0.04			0.04	
③ Perpendicularity between the Flange Face and Output Shaft	0.07			0.07			0.08			0.08	
④ Coaxiality of Output Axis and Mounting Socket Joint	0.07			0.07			0.08			0.08	

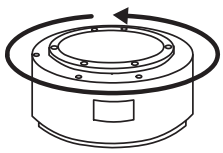
(2) Medium-capacity Series



Tolerance T.I.R.(Total Indicator Reading) Units: mm	Servomotor Model SGMCS-					
	45M	80M	1AM	80N	1EN	2ZN
① Run-out of the Surface of the Shaft	0.02			0.02		
② Run-out at the End of the Shaft	0.04			0.04		
③ Perpendicularity between the Flange Face and Output Shaft	—			—		
④ Coaxiality of Output Axis and Mounting Socket Joint	0.08			0.08		
⑤ Right angle between Flange Face and Output Shaft	0.08			0.08		

● Direction of Rotation

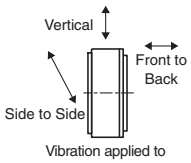
Positive rotation of the servomotor is counterclockwise when viewed from the load.



● Vibration Resistance

Mount the servomotor with the axis horizontal. The servomotor will withstand the following vibration acceleration in three directions: Vertical, side to side, and front to back.

Servomotor Type	Vibration Acceleration at Flange
Small-capacity Series	49 m/s²
Medium-capacity Series	24.5 m/s²

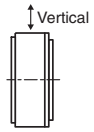


Vibration applied to the servomotor.

● Impact Resistance

Mount the servomotor with the axis horizontal. The servomotor will withstand the follwing vertical impacts:

- Impact Acceleration: 490 m/s²
- Number of Impacts: 2



Impact applied to the servomotor.

● Vibration Class

The vibration class at rated motor speed is 15 μm or below. (A vibration class of 15 μm or below indicates a total vibration amplitude of 15 μm maximum on the servomotor during rated rotation.)

● Enclosure

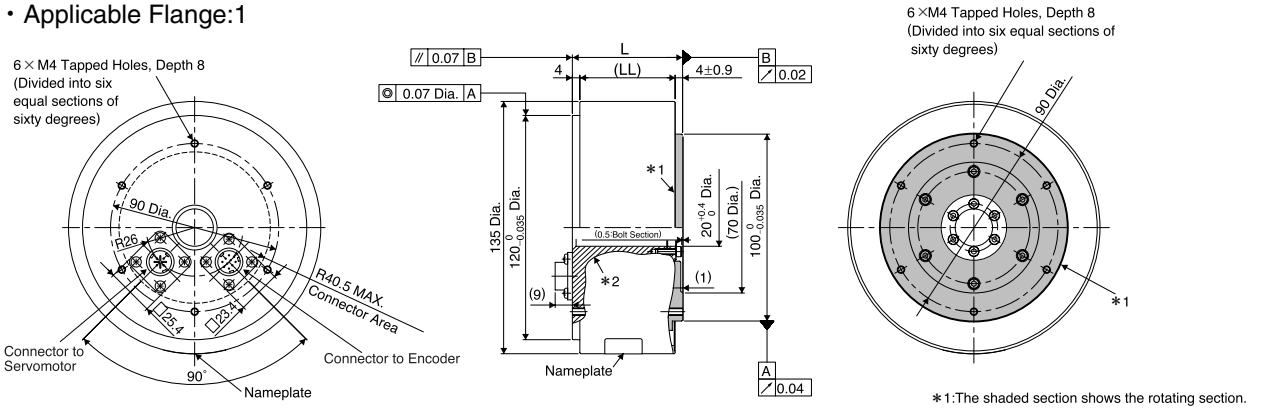
Servomotor Type	Enclosure
Small-capacity Series	IP42 (except for gaps on the rotating section of the shaft)
Medium-capacity Series	IP44

External Dimensions Units: mm

● Small-capacity Series

(1) Rated Torque: 2.0 to 7.0 N·m (Outer Diameter: 135 mm, Inner Diameter: 20 mm)

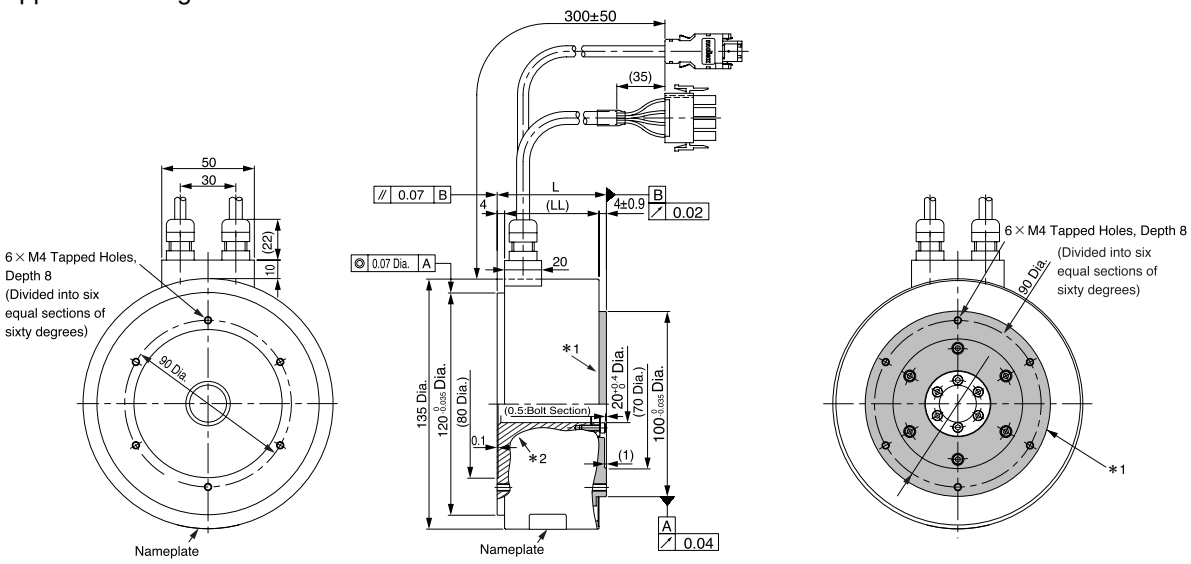
・Applicable Flange:1



*1:The shaded section shows the rotating section.
*2:The hatched section shows the non-rotating section.

Model SGMCS-	L	(LL)	Approx. Mass kg
02B□C11	59	51	4.8
05B□C11	88	80	5.8
07B□C11	128	120	8.2

・Applicable Flange:4

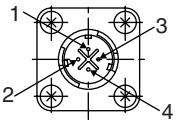


*1: The shaded section shows the rotating section.
*2: The hatched section shows the non-rotating section.

Model SGMCS-	L	(LL)	Approx. Mass kg
02B□C41	59	51	4.8
05B□C41	88	80	5.8
07B□C41	128	120	8.2

● Servomotor Connector for Small-capacity Series Servomotors (Applicable Flange: 1)

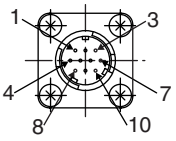
Connector Specifications for Servomotor



Model : JN1AS04MK2
Manufacturer : Japan Aviation Electronics Industry, Ltd.
Applicable plug: JN1DS04FK1
(To be provided by the customer.)

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

Connector Specifications for Encoder



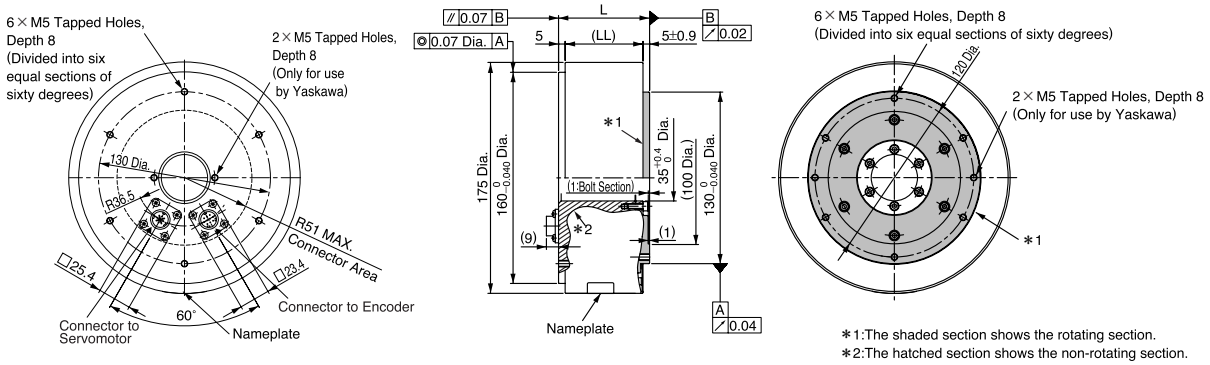
Model : JN1AS10ML1
Manufacturer : Japan Aviation Electronics Industry, Ltd.
Applicable plug: JN1DS10SL1
(To be provided by the customer.)

1	PS	Light blue	6	—	—
2	/PS	Light blue/white	7	FG (Frame ground)	Shield
3	—	—	8	—	—
4	PG5V	Red	9	PG0V	Black
5	—	—	10	—	—

External Dimensions Units: mm

(2) Rated Torque: 4.0 to 14.0 N·m (Outer Diameter: 175 mm, Inner Diameter: 35 mm)

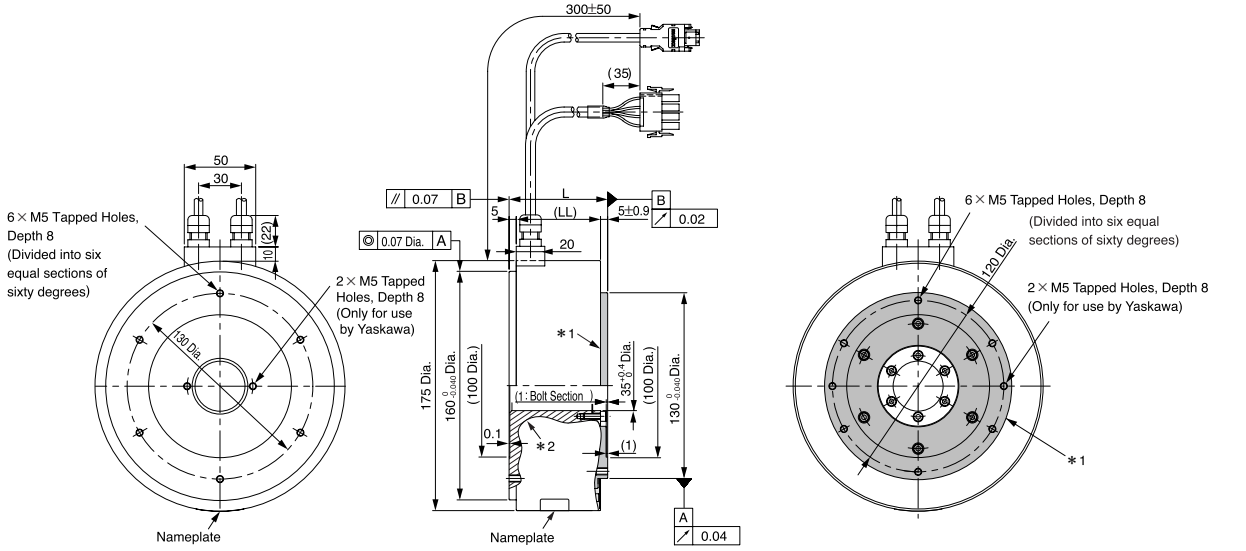
・Applicable Flange:1



∗1:The shaded section shows the rotating section.
∗2:The hatched section shows the non-rotating section.

Model SGMCS-	L	(LL)	Approx. Mass kg
04C□C11	69	59	7.2
10C□C11	90	80	10.2
14C□C11	130	120	14.2

・Applicable Flange:4

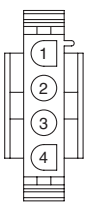


∗1:The shaded section shows the rotating section.
∗2:The hatched section shows the non-rotating section.

Model SGMCS-	L	(LL)	Approx. Mass kg
04C□C41	69	59	7.2
10C□C41	90	80	10.2
14C□C41	130	120	14.2

● Servomotor Connector (Applicable Flange:4)

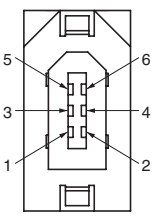
Connector Specifications for Servomotor



Model
・Plug : 350779-1
・Pin : 350561-3 or 350690-3 (No.1 to 3)
・Ground pin : 350654-1 or 350669-1 (No.4)
Manufacturer : Tyco Electronics AMP K.K.
Applicable plug
・Cap : 350780-1
・Socket : 350570-3 or 350689-3

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

Connector Specifications for Encoder



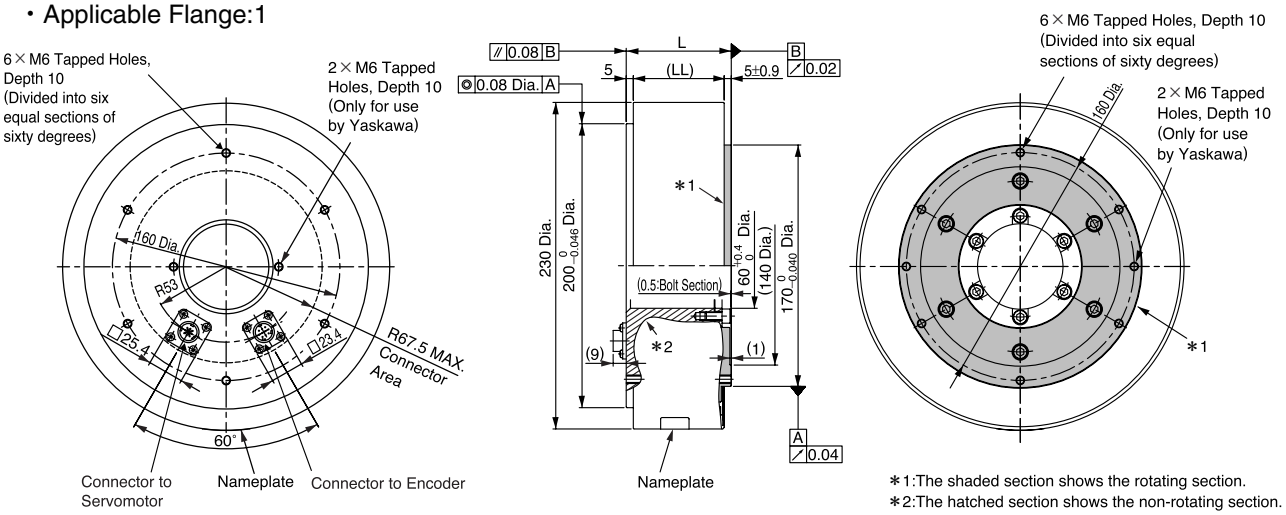
Model : 55102-0600
Manufacturer : Molex Japan Co., Ltd
Applicable plug : 54280-0600

1	PG5V	Red
2	PG0V	Black
3	—	—
4	—	—
5	PS	Light blue
6	/PS	Light blue/ white
Connector Case	FG (Frame ground)	Shield

External Dimensions Units: mm

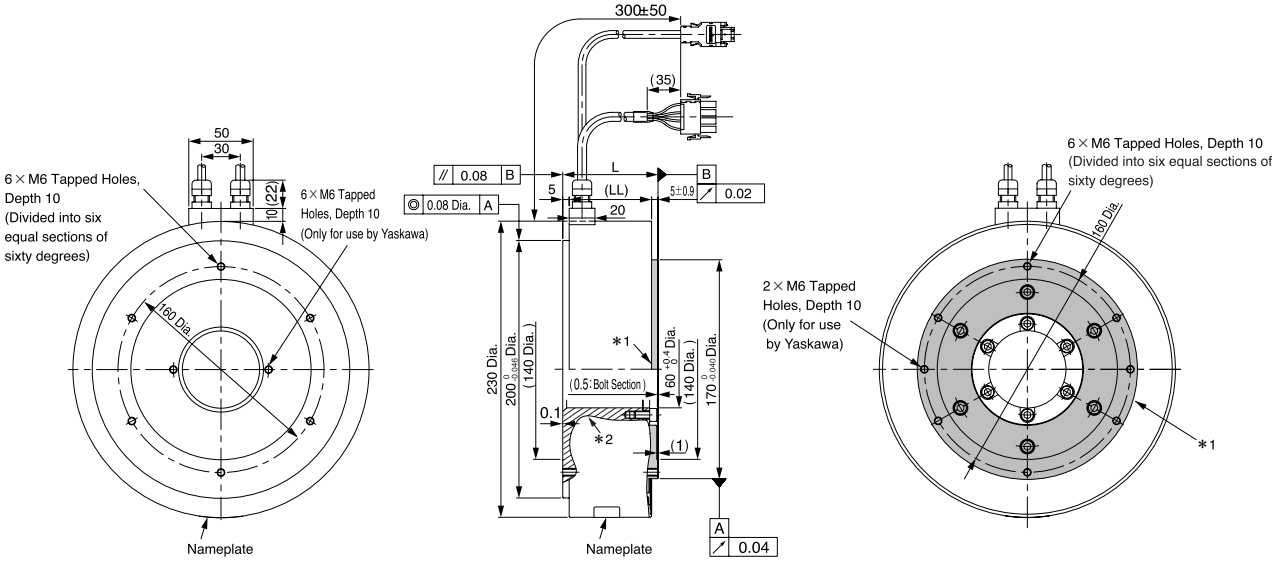
(3) Rated Torque: 8.0 to 25.0 N·m (Outer Diameter: 230 mm, Inner Diameter: 60 mm)

・Applicable Flange:1



Model SGMCS-	L	(LL)	Approx. Mass kg
08D□C11	74	64	14.0
17D□C11	110	100	22.0
25D□C11	160	150	29.7

・Applicable Flange:4

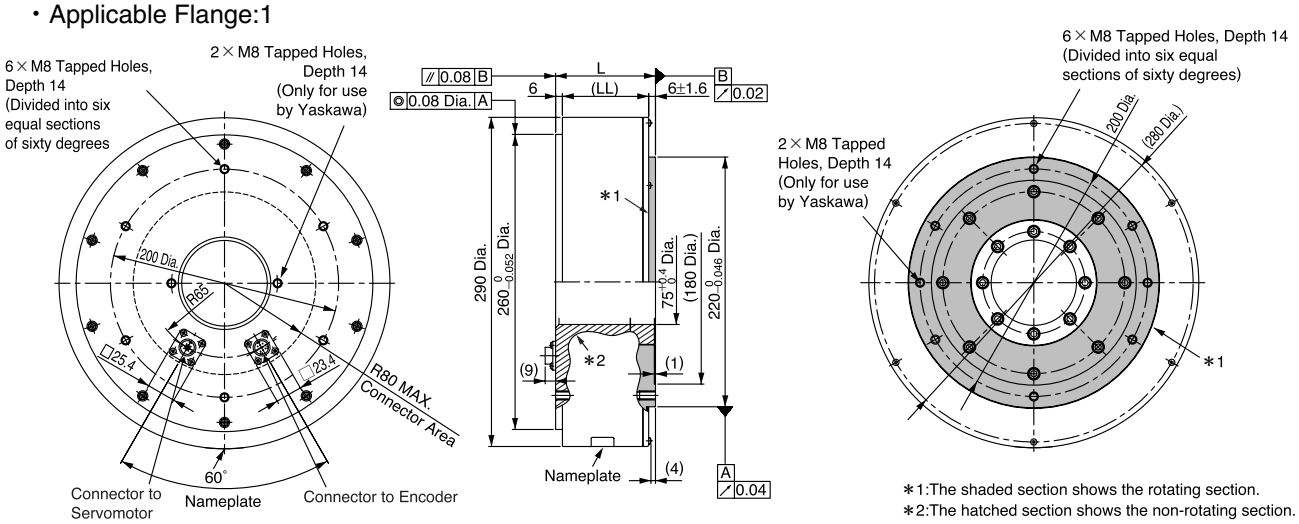


Model SGMCS-	L	(LL)	Approx. Mass kg
08D□C41	74	64	14.0
17D□C41	110	100	22.0
25D□C41	160	150	29.7

External Dimensions Units: mm

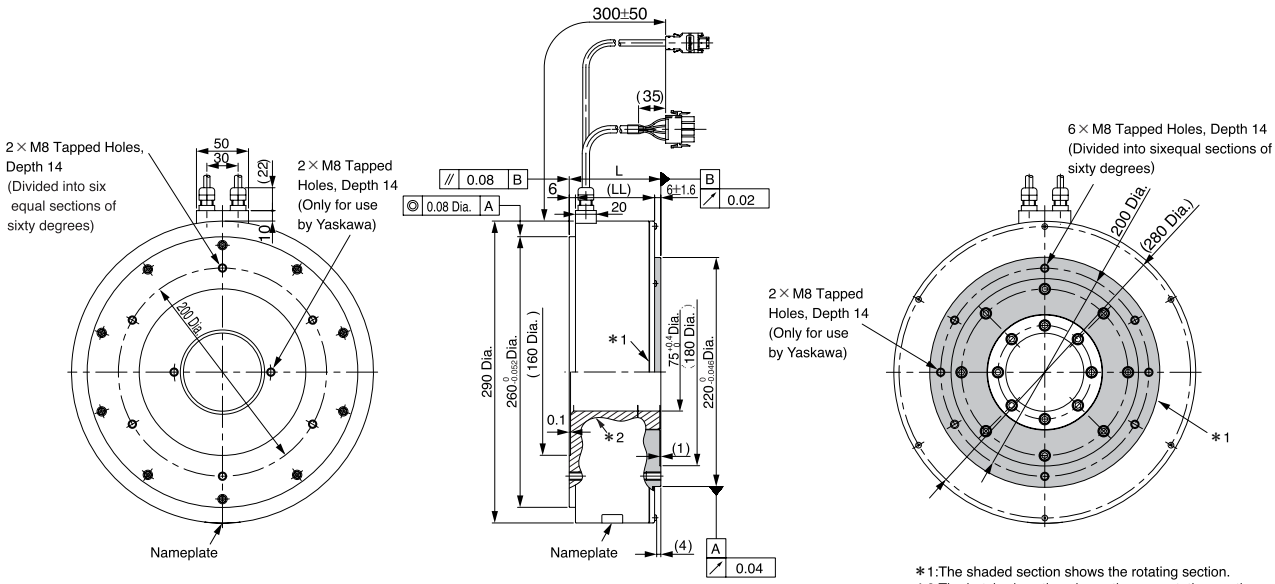
(4) Rated Torque: 16.0 to 35.0 N·m (Outer Diameter: 290 mm, Inner Diameter: 75 mm)

・Applicable Flange:1



Model SGMCS-	L	(LL)	Approx. Mass kg
16E□B11	88	76	26.0
35E□B11	112	100	34.0

・Applicable Flange:4



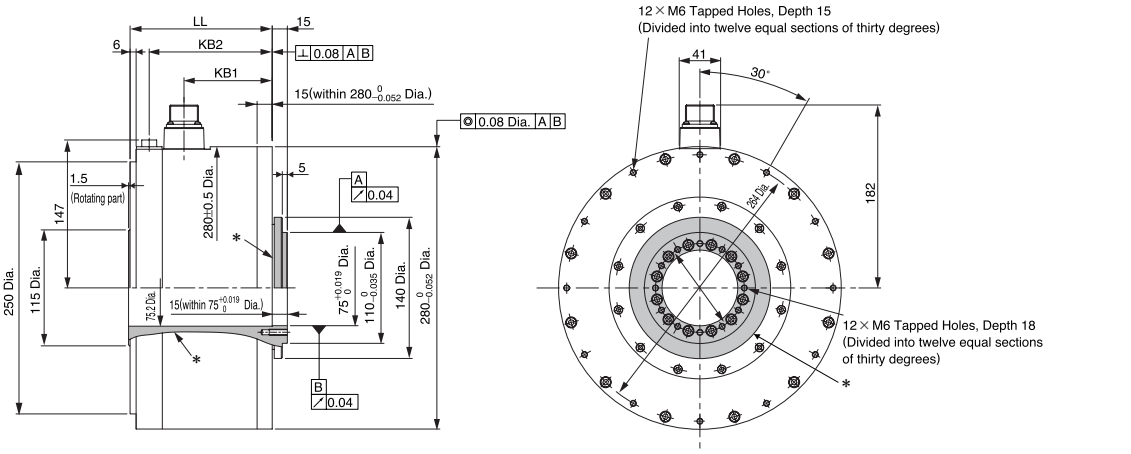
Model SGMCS-	L	(LL)	Approx. Mass kg
16E□B41	88	76	26.0
35E□B41	112	100	34.0

External Dimensions Units: mm

● Medium-capacity Series

(1) Rated Torque: 45 to 110 N·m (Outer Diameter: 280 mm, Inner Diameter: 75 mm)

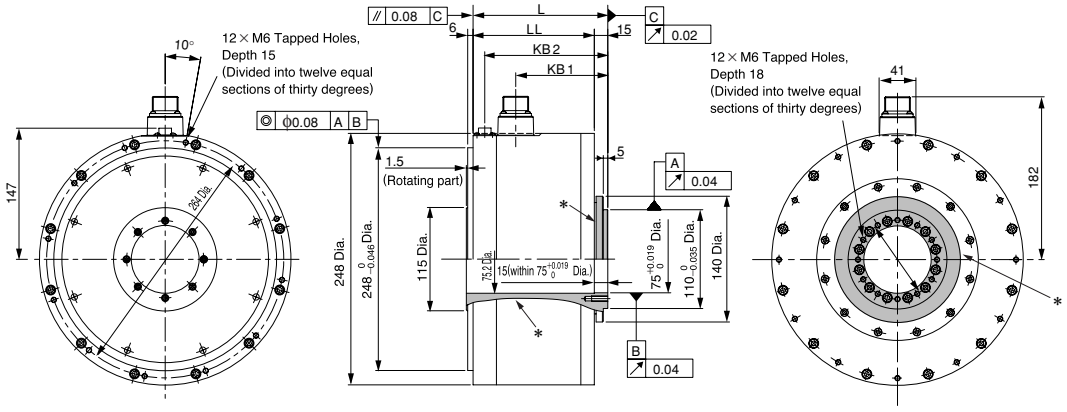
・Applicable Flange:1



*:The shaded section shows the rotating section.

Model SGMCS-	LL	KB1	KB2	Approx. Mass kg
45M□A11	141	87.5	122	38
80M□A11	191	137.5	172	45
1AM□A11	241	187.5	222	51

・Applicable Flange:3

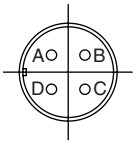


*:The shaded section shows the rotating section.

Model SGMCS-	L	LL	KB1	KB2	Approx. Mass kg
45M□A31	150	135	102.5	137	38
80M□A31	200	185	152.5	187	45
1AM□A31	250	235	202.5	237	51

● Servomotor Connector for Medium-capacity Series Servomotors (Applicable Flange: 1, 3)

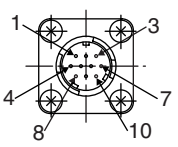
Connector Specifications for Servmotor
(Same for All Medium-capacity Models)



Model : CE05-2A18-10PD
Manufacturer: DDK Ltd.
Applicable plug and cable clamp
Plug : CE05-6A18-10SD-B-BSS
Cable clamp : CE3057-10A-□ (D265)
(To be provided by the customer.)

A	Phase U
B	Phase V
C	Phase W
D	FG (Frame ground)

Connector Specifications for Encoder
(Same for All Medium-capacity Models)



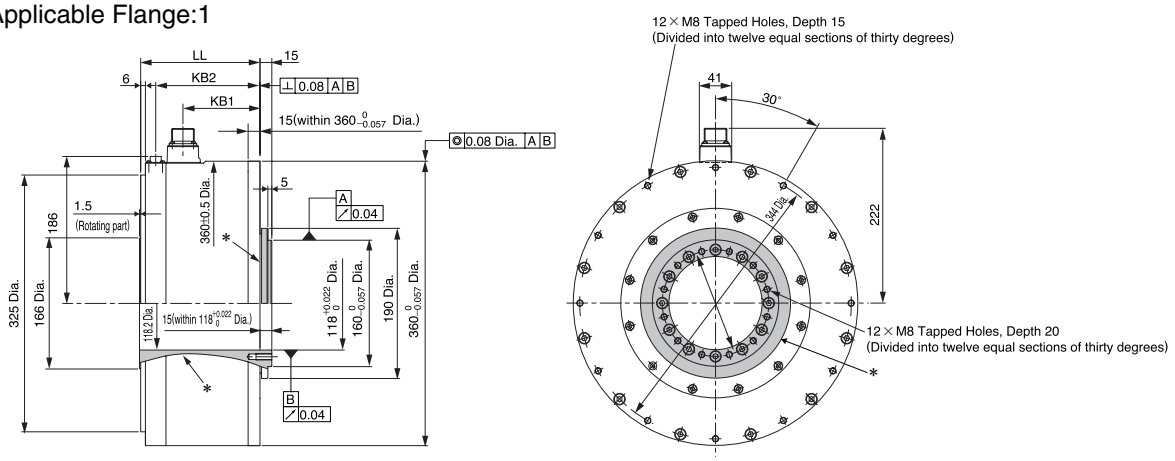
Model : JN1AS10ML1
Manufacturer : Japan Aviation Electronics Industry, Ltd.
Applicable plug: JN1DS10SL1
(To be provided by the customer.)

1	PS	6	–
2	/PS	7	FG (Frame ground)
3	–	8	–
4	PG5 V	9	PG0 V
5	–	10	–

External Dimensions Units: mm

(2) Rated Torque 80 to 200 N·m (Outer Diameter: 360 mm, Inner Diameter: 118 mm)

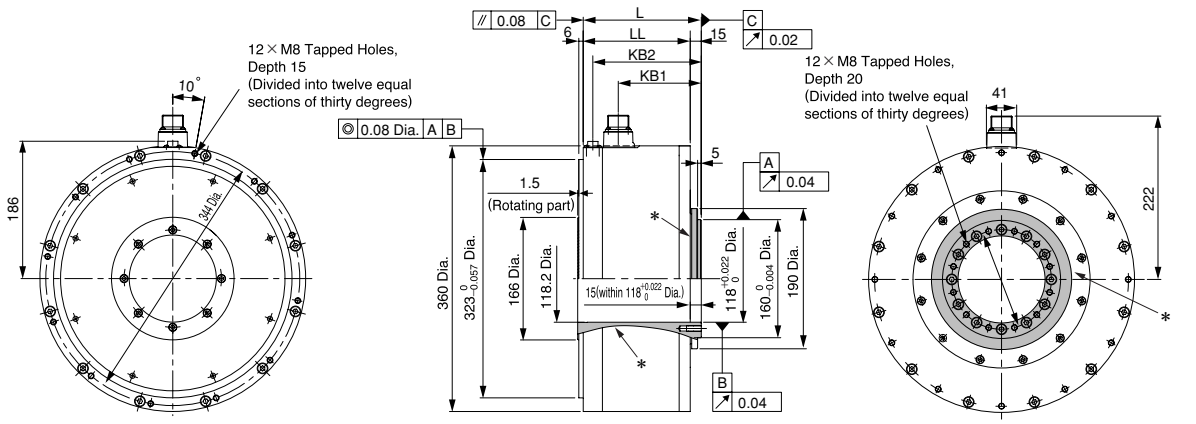
・Applicable Flange:1



*:The shaded section shows the rotating section.

Model SGMCS-	LL	KB1	KB2	Approx. Mass kg
80N□A11	151	98	132	50
1EN□A11	201	148	182	68
2ZN□A11	251	198	232	86

・Applicable Flange:3

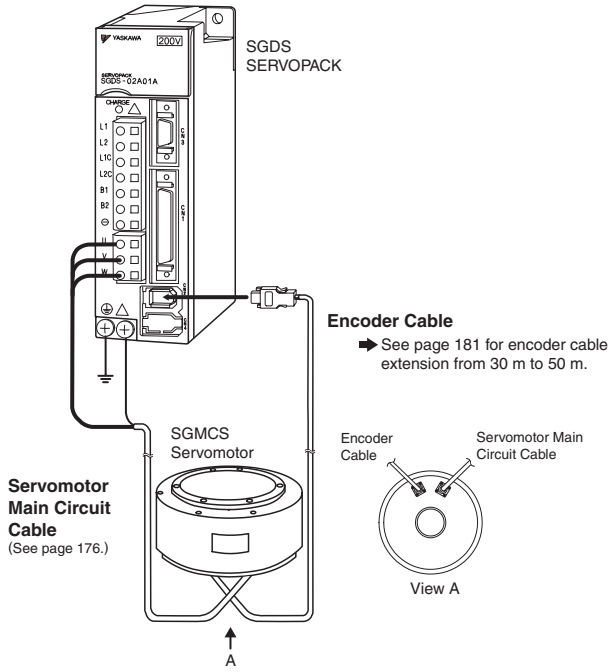


*:The shaded section shows the rotating section.

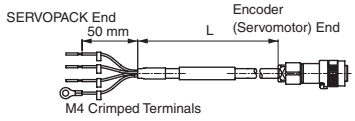
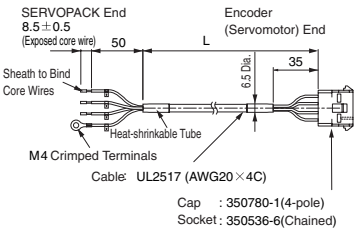
Model SGMCS-	L	LL	KB1	KB2	Approx. Mass kg
80N□A31	160	145	113	147	50
1EN□A31	210	195	163	197	68
2ZN□A31	260	245	213	247	86

Selecting Cables

● Cables Connections



● Servomotor Main Circuit Cables

	Name	Length L	Order No. Standard Cable	Order No. Flexible Cable*1	Specifications	Details
Small-capacity Series	Cable with Loose Wire at SERVOPACK End	3 m	JZSP-CMM60-03-E	JZSP-CSM60-03-E	Applicable Flange*2 : 1 	(1)
		5 m	JZSP-CMM60-05-E	JZSP-CSM60-05-E		
		10 m	JZSP-CMM60-10-E	JZSP-CSM60-10-E		
		15 m	JZSP-CMM60-15-E	JZSP-CSM60-15-E		
		20 m	JZSP-CMM60-20-E	JZSP-CSM60-20-E		
		3 m	JZSP-CMM00-03-E	JZSP-CMM01-03-E	Applicable Flange*2 : 4 	
		5 m	JZSP-CMM00-05-E	JZSP-CMM01-05-E		
		10 m	JZSP-CMM00-10-E	JZSP-CMM01-10-E		
		15 m	JZSP-CMM00-15-E	JZSP-CMM01-15-E		
		20 m	JZSP-CMM00-20-E	JZSP-CMM01-20-E		
	Servomotor-end Connector		JN1DS04FK1		Soldered	(2)
	Cables	5 m	JZSP-CSM90-05-E	JZSP-CSM80-05-E	50 m Max. 	(3)
		10 m	JZSP-CSM90-10-E	JZSP-CSM80-10-E		
		15 m	JZSP-CSM90-15-E	JZSP-CSM80-15-E		
		20 m	JZSP-CSM90-20-E	JZSP-CSM80-20-E		
		50 m	JZSP-CSM90-50-E	JZSP-CSM80-50-E		
	Medium-capacity Series: Cables		Contact your Yaskawa representative for cables with connectors and cables and connectors.			(4)

*1: Use flexible cables for movable sections such as robot arms.
*2: For applicable flanges, see model designations on page 164.
Note: SGMCS servomotors with holding brakes are not available.

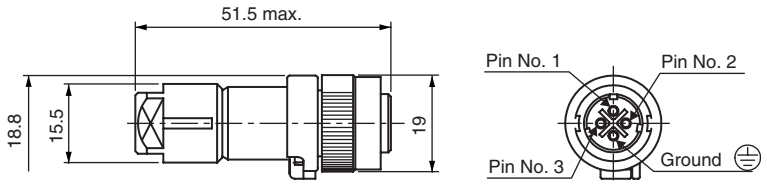
Selecting Cables

(1) For Small-capacity Series: Wiring specifications

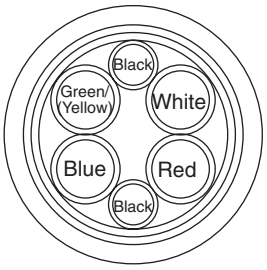
・Applicable Flange:1, 4

To SERVOPACK		To Servomotor	
Lead Color	Signal	Signal	Pin No.
Red	Phase U	Phase U	1
White	Phase V	Phase V	2
Blue	Phase W	Phase W	3
Green/(Yellow)	FG	FG	4

(2) For Small-capacity Series : Connector Specifications for Servomotors

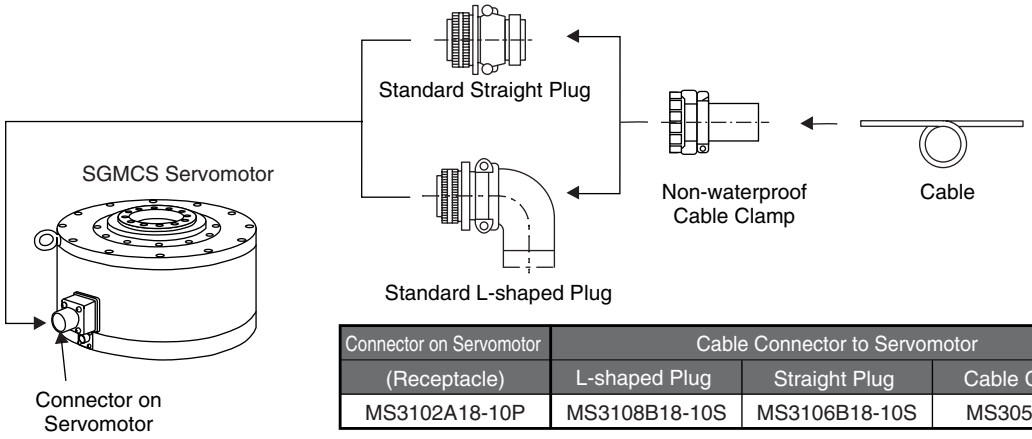
Items	Specifications
Manufacturer	Japan Aviation Electronics Industry, Ltd.
Order No.	JN1DS04FK1 (Soldered)
Outer Diameter of Applicable Cable	5.7 mm to 7.3 mm
Dimensional Drawings (Units: mm)	

(3) For Small-capacity Series : Cable Specifications

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CSM90-□□-E (50 m max.)	JZSP-CSM80-□□-E (50 m max.)
Specifications	UL2517 (Max. operating temperature: 105˚C) AWG20×6C For power line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.53 mm For holding brake line: AWG20 (0.52 mm²) Outer diameter of insulating sheath: 1.53 mm	UL2517 (Max. operating temperature: 105˚C) AWG22×6C For power line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm For holding brake line: AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.37 mm
Finished Dimensions	7±0.3 dia. mm	
Internal Configuration and Lead Color		
Yaskawa Standard Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m, 50 m	

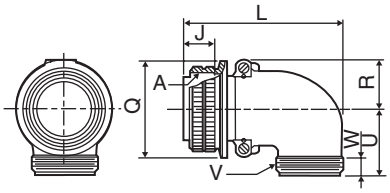
*: Specify the cable length in □□ of ordr No.
Example: JZSP-CSM90-15 -E(15 m)

(4) For Medium-capacity Series (SGMCS-□□M and N): Connector Specifications



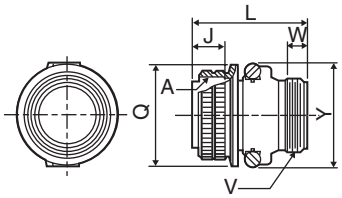
Connector on Servomotor	Cable Connector to Servomotor		
(Receptacle)	L-shaped Plug	Straight Plug	Cable Clamp
MS3102A18-10P	MS3108B18-10S	MS3106B18-10S	MS3057-10A

- Dimensional Drawings: MS3108B L-shaped Plug Shell



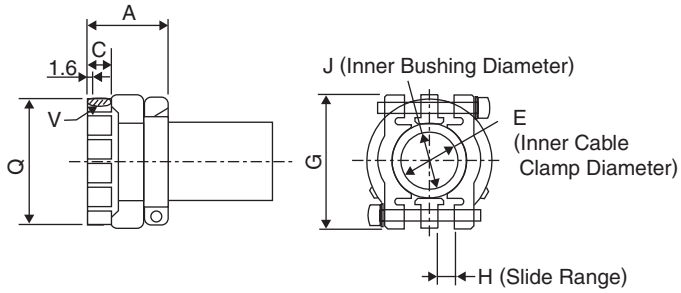
Model No.	Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L Max.	Outer Diameter of Joint Nut Q $^{+0}_{-0.38}$	R ±0.5	U ±0.5	Cable Clamp Set Screw V	Effective Screw Length W Min.
MS 3108B	18	1 1/8-18UNEF	18.26	68.27	34.13	20.5	30.2	1-20UNEF	9.53

- Dimensional Drawings: MS3106B Straight Plug Shell



Model No.	Shell Size	Joint Screw A	Length of Joint Portion J±0.12	Overall Length L Max.	Outer Diameter of Joint Nut Q $^{+0}_{-0.38}$	Cable Clamp Set Screw V	Effective Screw Length W Min.	Maximum Width Y Max.
MS 3106B	18	1 1/8-18UNEF	18.26	52.37	34.13	1-20UNEF	9.53	42

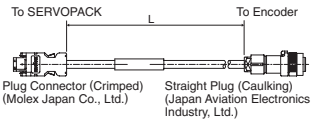
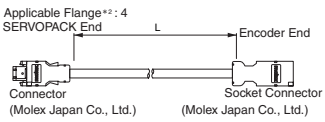
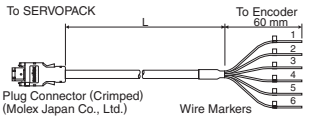
- Dimensional Drawings: MS3057-10A Cable Clamp with Rubber Bushing



Model No.	Applicable Connector Shell Size	Overall Length A±0.7	Effective Screw Length C	E	G±0.7	H	J	Set Screw V	Outer Diameter Q±0.7	Attached Bushing
MS3057-10A	18	23.8	10.3	15.9	31.7	3.2	14.3	1-20UNEF	30.1	AN3420-10

Selecting Cables

● Encoder Cables and Connectors (Max. length : 20 m)

Name	Length	Order No.		Specifications	Details
		Standard Cable	Flexible Cable*1		
Encoder Cable with Connectors (Same for Incremental and Absolute Encoders)	3 m	JZSP-CMP60-03-E	JZSP-CSP60-03-E	Applicable Flange*2 : 1, 3 	(1)
	5 m	JZSP-CMP60-05-E	JZSP-CSP60-05-E		
	10 m	JZSP-CMP60-10-E	JZSP-CSP60-10-E		
	15 m	JZSP-CMP60-15-E	JZSP-CSP60-15-E		
	20 m	JZSP-CMP60-20-E	JZSP-CSP60-20-E		
	3 m	JZSP-CMP00-03-E	JZSP-CMP10-03-E	Applicable Flange*2 : 4 	(2)
	5 m	JZSP-CMP00-05-E	JZSP-CMP10-05-E		
	10 m	JZSP-CMP00-10-E	JZSP-CMP10-10-E		
	15 m	JZSP-CMP00-15-E	JZSP-CMP10-15-E		
	20 m	JZSP-CMP00-20-E	JZSP-CMP10-20-E		
Encoder Cable with Loose Wires at Encoder End (Same for Incremental and Absolute Encoders)	3 m	JZSP-CMP03-03-E	JZSP-CMP13-03-E		(3)
	5 m	JZSP-CMP03-05-E	JZSP-CMP13-05-E		
	10 m	JZSP-CMP03-10-E	JZSP-CMP13-10-E		
	15 m	JZSP-CMP03-15-E	JZSP-CMP13-15-E		
	20 m	JZSP-CMP03-20-E	JZSP-CMP13-20-E		
Connector Kit to SERVOPACK		JZSP-CMP9-1		Soldered  (Molex Japan Co., Ltd.)	(4)
Connector to Encoder (Straight Plug)		JN1DS10SL1		Crimping Type (A crimp tool is required.)  (Japan Aviation Electronics Industry, Ltd.)	
Connector to Encoder (Socket Contact)		JN1-22-22S-PKG100			
Cables	5 m	JZSP-CMP09-05-E	JZSP-CSP39-05-E	20 m Max. 	(5)
	10 m	JZSP-CMP09-10-E	JZSP-CSP39-10-E		
	15 m	JZSP-CMP09-15-E	JZSP-CSP39-15-E		
	20 m	JZSP-CMP09-20-E	JZSP-CSP39-20-E		

*1: Use flexible cables for movable sections such as robot arms.
*2: For applicable flanges, see model designations on page 164.

(1) Wiring Specifications for Cable with Connectors

・Applicable Flange: 1, 3

(Standard type)

SERVOPACK End		Encoder (Servomotor) End	
Pin No.	Signal	Pin No.	Wire Color
1	PG5V	4	Red
2	PG0V	9	Black
5	PS	1	Light blue
6	/PS	2	Light blue/white
Shell	FG	7	FG Shield wire

Shield Wire

(Flexible type)

SERVOPACK End		Encoder End	
Pin No.	Signal	Pin No.	Wire Color
1	PG5V	4	Orange
2	PG0V	9	Green
5	PS	1	Black/light blue
6	/PS	2	Red/light blue
Shell	FG	7	FG Shield wire

Shield Wire

Note: Be sure to connect the shield wire of encoder cable to the connector case (shell).

(2) Wiring Specifications for Cable with Connectors

・Applicable Flange: 4

(Standard type)

SERVOPACK End		Encoder (Servomotor) End	
Pin No.	Signal	Pin No.	Wire Color
1	PG5V	1	Red
2	PG0V	2	Black
5	PS	5	Light blue
6	/PS	6	Light blue/white
Shell	FG	Shell	FG Shield wire

Shield Wire

(Flexible type)

SERVOPACK End		Encoder End	
Pin No.	Signal	Pin No.	Wire Color
1	PG5V	1	Orange
2	PG0V	2	Green
5	PS	5	Red/light blue
6	/PS	6	Black/light blue
Shell	FG	7	FG Shield wire

Shield Wire

Note: Be sure to connect the shield wire of encoder cable to the connector case (shell).

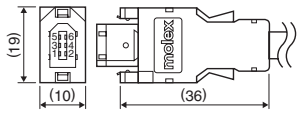
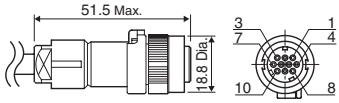
(3) Wiring for Cable with Loose Wires to Encoder

To SERVOPACK		To Encoder (Servomotor)		
Pin No.	Signal	Lead Color		Marker
		Standard	Flexible	
6	/PS	Light blue/white	Black/light blue	6
5	PS	Light blue	Red/light blue	5
4	BAT(−)	Orange/white	Black/pink	4
3	BAT(+)	Orange	Red/pink	3
2	PG 0V	Black	Green	2
1	PG 5V	Red	Orange	1
Shell	FG			

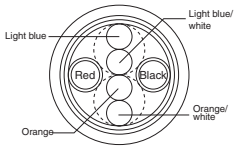
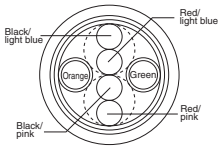
Shield Wire

Notes: 1 The signals BAT(+) and BAT(−) are not needed when using SGMCS servomotors.
2 Be sure to connect the shield wire of encoder cable to the connector case (shell).

(4) Connectors to SERVOPACK

Items	To SERVOPACK	To Servomotor
Order No.	JZSP-CMP9-1-E	Tools are not included.
Manufacturer	Molex Japan Co., Ltd.	Japan Aviation Electronics Industry, Ltd.
Specifications	55100-0670 (soldered) Note: 55100-0670 (soldered) when using a connector kit	Straight plug:JN1DS10SL1 (crimped) Socket plug:JN1-22-22S-PKG100 Outer diameter of applicable cable : 5.7 to 7.3 mm Applicable wire size: AWG21 to 25 Outer diameter of insulating sheath: 0.8 to 1.5 mm Crimp tool (hand tool) model No.: CT150-2-JN
Dimensional Drawings (Units: mm)		

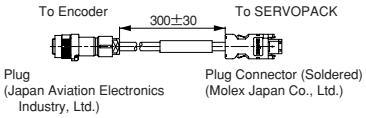
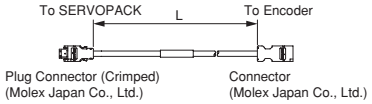
(5) Cables

Items	Standard Cable	Flexible Cable
Order No.*	JZSP-CMP09-□□-E	JZSP-CSP39-□□-E
Cable Length	20 m max.	
Specifications	UL20276 (Max. operating temperature: 80˚C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.15 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.09 mm	UL20276 (Max. operating temperature: 80˚C) AWG22×2C+AWG24×2P AWG22 (0.33 mm²) Outer diameter of insulating sheath: 1.35 mm AWG24 (0.20 mm²) Outer diameter of insulating sheath: 1.21 mm
Finished Dimensions	6.5 dia. mm	6.8 dia. mm
Internal Configuration and Lead Colors		
Yaskawa Standard Specifications (Standard Length)	Cable length: 5 m, 10 m, 15 m, 20 m	

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP09-05-E (5 m)

Selecting Cables

● Encoder Cables and Connectors (For Extending from 30 m up to 50 m)

Name		Length	Order No. Standard Cable	Specifications	Details
Relay Encoder Cables(for Relay)	For Encoder (Same for Incremental and Absolute Encoders) Only for 100 to 400 W	0.3 m	JZSP-CSP15-E		(1)
Encoder cable for 50 m extension	(Same for Incremental and Absolute Encoders)	30 m	JZSP-UCMP00-30-E		(2)
		40 m	JZSP-UCMP00-40-E		
		50 m	JZSP-UCMP00-50-E		
Encoder cable for 50 m extension	30 m to 50 m encoder cables are available.	30 m	JZSP-CMP19-30-E	50 m Max. 	(3)
		40 m	JZSP-CMP19-40-E		
		50 m	JZSP-CMP19-50-E		

(1) Wiring for Relay Encoder Cable to Encoder (for Relay) (For Incremental and Absolute Encoders)

To SERVOPACK		To Encoder (Servomotor)	
Pin No.	Signal	Pin No.	Lead Color
1	PG 5V	4	Red
2	PG 0V	9	Black
5	PS	1	Light blue
6	/PS	2	Light blue/White
Shell	FG	7	FG Shield

Shield Wire

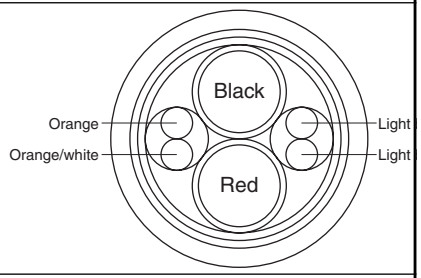
Note: Be sure to connect the shield wire of encoder cable to the connector case (shell).

(2) Wiring specification of 50 m encoder cable extension

To SERVOPACK		To Encoder (Servomotor)	
Pin No.	Signal	Pin No.	Lead Color
6	/PS	6	Light blue/white
5	PS	5	Light blue
4	BAT(–)	4	Orange/white
3	BAT(+)	3	Orange
2	PG 0V	2	Black
1	PG 5V	1	Red
Shell	FG	Shell	FG

Shield Wire

(3) Specification of 50 m encoder cable extension

Application	Standard Cable
Order No.*	JZSP-CMP19-□□-E
Cable Length	50 m max.
Specifications	UL20276 (Max. operating temperature: 80℃) AWG16×2C+AWG26×2P AWG16 (1.31 mm²) Outer diameter of insulating sheath: 2.0 mm AWG26 (0.13 mm²) Outer diameter of insulating sheath: 0.91 mm
Finished Dimensions	6.8 dia. mm
Internal Configuration and Lead Colors	
Yaskawa Standard Specifications (Standard Length)	Cable length: 30 m, 40 m, 50 m

*: Specify the cable length in □□ of order No.
Example: JZSP-CMP19-30 -E(30 m)

SERVOPACKs

For Rotary Servomotors

SGDS-□□□01

(Analog Voltage Reference or Pulse-train Reference)

SGDS-□□□02

(Fully-closed Control)

With the optimum functions to drive your machine rapidly and accurately and with the latest technology to quickly and precisely adapt the servo drive to your machine, the Σ-Ⅲ series of SERVOPACKs has been developed for high-speed, high-frequency, and high-accuracy positioning.

Features

● High performance

With cutting-edge technology such as the 600-Hz frequency response, less-deviation control, and vibration suppression control, the Σ-Ⅲ SERVOPACKs attain smooth positioning at high speeds with minimum vibration.

● Various tuning functions

Adjusts the servo according to the actual operation conditions and reduce the time required to set the servo drive.

● New digital operator

With the liquid-crystal digital operator, monitor four types of data, including parameter settings, at the same time to make tuning the servo drive even easier.

● New upgrades for enhanced performance

With new functions to suppress vibrations, to optimize machine performance, to simplify setup, and to meet your system requirements with greater flexibility, make the necessary settings more quickly than ever.

Model Designation

SGDS - A5 A 01 A □

Σ-Ⅲ Series
SGDS SERVOPACK

Max. Rated Output of Applicable Servomotor

Code	Specifications
A3	30 W
A5	50 W
01	100 W
02	200 W
04	400 W
05	500 W
08	750 W
10	1.0 kW
15	1.5 kW
20	2.0 kW
30	3.0 kW
50	5.0 kW
60	6.0 kW
75	7.5 kW

Power Supply Voltage

Code	Specifications
A	200 VAC
F	100 VAC (100-V input, 200-V output: Doubled voltage)
B	100 VAC (100-V input, 100-V output: For SGMMJ servomotors)

Interface Specifications
01 : Analog voltage reference or pulse-train reference (For rotary servomotors)
02 : Analog voltage reference or pulse-train reference, and fully closed control (For rotary servomotors)

Design Revision Order
A, B, · · ·

Mounting Method
Blank: Base-mounted (7.5 kW or less)
R: Rack-mounted (5.0 kW or less)

Ratings and Specifications

SERVOPACK Model SGDS-				A3B	A5	01	02	04	05	08	10	15	20	30	50	60	75
Basic Specifications	Max. Applicable Servomotor Capacity kW			0.03	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	6.0	7.5
	100 V	Continuous Output Current Arms		0.98	0.66	0.91	2.1	2.8	–								
		Max. Output Current Arms		2.9	2.1	2.8	6.5	8.5	–								
	200 V	Continuous Output Current Arms		–	0.66	0.91	2.1	2.8	3.8	5.5	7.6	11.6	18.5	18.9	32.9	46.9	54.7
		Max. Output Current Arms		–	2.1	2.8	6.5	8.5	11.0	16.9	17.0	28.0	42.0	56.0	84.0	110	130
	Input Power Supply	SERVOPACK Capacity Range for 100/200 V		Single-phase 100 VAC					–								
				–	Single-phase 200 VAC				–	Single-phase 200 VAC	–						
				–					Three-phase 200 VAC	–	Three-phase 200 VAC						
		200 V	Main Circuit	Three-phase (or single-phase) 200 to 230 VAC + 10 to −15%, 50/60Hz													
			Control Circuit	Single-phase 200 to 230 VAC + 10 to −15%, 50/60 Hz													
		100 V	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													
	Control Method			Single or three-phase full-wave rectification IGBT-PWM (sine-wave driven) [Single-phase full-wave rectification for SGDS-A3B (100 V)]													
	Feedback			Encoder: 13-bit (incremental) Encoder: 17-bit (incremental/absolute) Encoder: 20-bit (incremental/absolute)													
	Opertating Conditions	Surrounding Air/Storage Temperature		0°C to + 55°C/−20°C to + 85°C													
		Ambient/Storage Humidity		90% RH or less (with no condensation)													
		Vibration/Shock Resistance		4.9 m/s² / 19.6 m/s²													
	Configuration			Base-mounted (Rack mounting available as an option for SGDS-A3 to -50)													
	Performance	Speed Control Range		1:5000 (The lowest speed of the speed control range is the speed at which the servomotor will not stop with a rated torque load.)													
		Speed Control Regulation*	Load Regulation	0 to100% load: ±0.01% max. (at rated speed)													
			Voltage Regulation	Rated voltage±10%: 0% (at rated speed)													
			Temperature Regulation	25±25°C: ±0.1% max. (at rated speed)													
		Frequency Characteristics		600 Hz (at $J_L = J_M$)													
		Torque Control Tolerance (Repeatability)		± 1%													
		Soft Start Time Setting		0 to10 s (Can be set individually for acceleration and deceleration.)													
Buit-in Functions	Dynamic Brake (DB)			Operated at main power OFF, servo alarm, servo OFF, or overtravel													
	Regenerative Processing			External regenerative resistor					Built-in							External regenerative resistor	
	Overtravel Prevention (OT)			Dynamic brake stop at P-OT or N-OT: the motor decelerates to a stop or coasts to a stop.													
	Electronic Gear			0.001≦B/A≦1000													
	Protection			Overcurrent, overvoltage, low voltage, overload, regeneration error, main circuit sensor error, heat sink overheat, power phase loss, position error pulse overflow, overspeed, encoder error, overrun detection, CPU error, parameter error, and so on.													
	LED Display			CHARGE, five 7-segment LEDs (built-in Digital Operator functions)													
	Others			Reverse connection, zero position search, automatic motor discrimination function													

*: 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 voltge variations or amplifier drift and changes in processing resistance due to temperature variation. The ratio of speed changes to the rated speed represents speed regulation due to voltage and temperature variations.

Ratings and Specifications

Applicable SERVOPACK Model					SGDS-A5A05A to 30A05A All Capacities
Torque/Speed/Position Control	Torque Control	Input Signals	Reference Voltage		±3 VDC (Variable setting range: ±1 to ±10 VDC) at rated torque, input voltage: ±12 V (max.) (forward rotation with positive reference)
			Input Impedance		About 14 kΩ min.
			Circuit Time Constant		30 μs
	Speed Control	Performance	Soft Start Time Setting		0 to 10 s (Can be set individually for acceleration and deceleration.)
		Input Signals	Reference Voltage		±6 VDC (Variable setting range: ±2 to ±10 VDC) at rated torque, input voltage: ±12 V (max.) (forward rotation with positive reference)
			Input Impedance		About 14 kΩ min.
			Circuit Time Constant		30 μs
		Setting Speed Reference	Rotation Direction Selection		With P control signal
			Speed Selection		With forward/reverse torque limit signal (speed 1 to 3 selection), servomotor stops or another control method is used when both are OFF.
	Position Control	Performance	Bias Setting		0 to 450 min^{-1} (setting resolution: 1 min^{-1})
			Feed-forward Compensation		0 to 100% (setting resolution: 1%)
			Positioning Completed Width Setting		0 to 1073741824 reference units (setting resolution: 1 reference unit)
		Input Signals	Reference Pulse	Type	sign+pulse train, CW+CCW pulse train, or 90°phase difference 2-phase pulse (phase A + phase B)
				Form	Non-insulated line driver (+5 V level)
				Frequency	1 Mpps max. (non-insulated line driver)
			Control Signal		Clear Signal
I/O signals		Position Output	Form		Phase-A, -B, -C line driver
			Frequency Dividing		Any Setting Ratio
		Sequence Input	Signal allocation can be modified.		Servo ON, P control (or Control Mode switching, forward/reverse motor rotation by internal speed setting, zero clamping, reference pulse inhibit), forward run prohibited (P-OT), reverse run prohibited (N-OT), alarm reset, forward external torque limit, reverse external torque limit (or internal set speed control), and gain changeover
		Sequence Output	Fixed Output		Servo alarm, 3-bit alarm codes
			Signal allocation can be modified.		Select any three of the following signals: positioning completion (speed coincidence), rotation detection, servo ready, current limit, warning, positioning near, or brake signal.
Others		Analog Monitor (CN5)			Output voltage: ±8 VDC Analog monitor connector built in for monitoring speed, torque, and other reference signals. Speed: 1 V/1000 min^{-1} Torque: 1 V/rated torque Position error pulse: 0.05 V/reference uint
		Communications	Interface		Digital Operator (hand type)
			Function		Status display, parameter setting, monitor display, alarm traceback display, and JOG operation

● 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 Capacity kW	SERVOPACK Model SGDS-	Power Supply Capacity kVA	Output Current (Effective Value) A	Main Circuit Power Loss W	Regenerative Resistor Power Loss*1 W	Control Circuit Power Loss W	Total Power Loss W
Single-phase 100 V	0.03	A3B	0.25	1.98	5.2	*2	13	19.2
	0.05	A5F	0.25	0.66	5.2			18.2
	0.10	01F	0.40	0.91	12			25
	0.20	02F	0.60	2.1	16.4			29.4
	0.40	04F	1.2	2.8	24			37
Single-phase 200 V	0.05	A5A	0.25	0.66	4.6			17.6
	0.10	01A	0.40	0.91	6.7			19.7
	0.20	02A	0.75	2.1	13.3			26.3
	0.40	04A	1.2	2.8	20			33
	0.75	08A	2.2	5.5	47	12	15	74
Three-phase 200 V	0.5	05A	1.4	3.8	27	8		54
	1.0	10A	2.3	7.6	55	12		82
	1.5	15A	3.2	11.6	92	10		117
	2.0	20A	4.3	18.5	120	16		151
	3.0	30A	5.9	18.9	155	16		186
	5.0	50A	7.5	32.8	255	36	19	310
	6.0	60A	12.5	46.9	360	*3		379
	7.5	75A	15.5	54.7	455			474

*1: Regenerative resistor power losses are allowable losses. Take the following action if this value is exceeded.
- Remove the lead from the internal regenerative resistor in the SERVOPACK.
- Install an external regenerative resistor.

An external regenerafive resistor is available as an option.

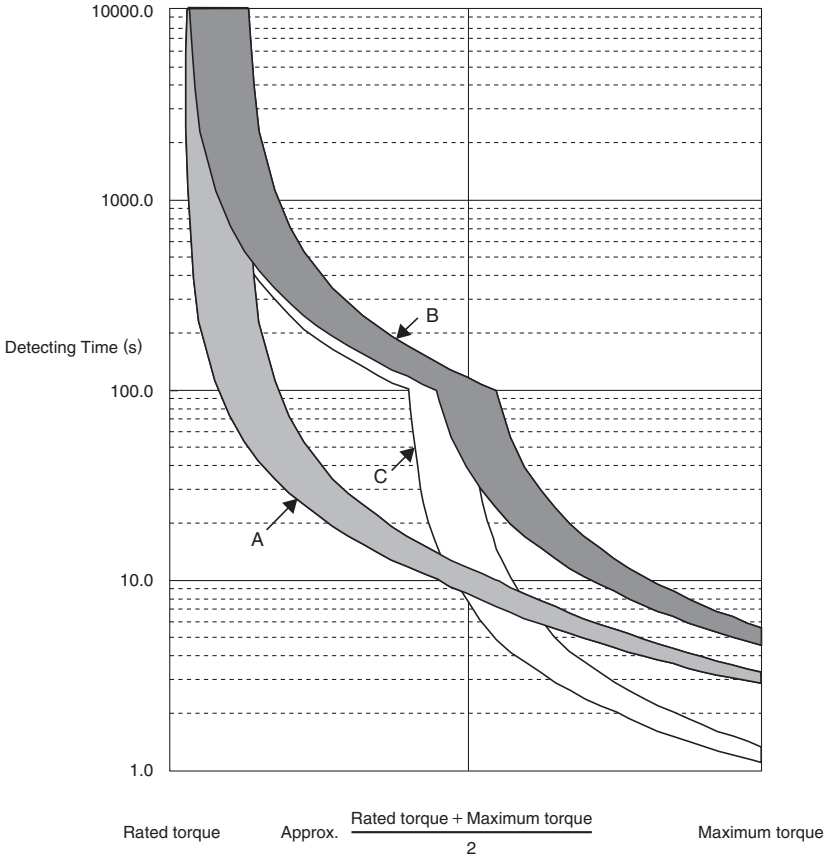
*2: SERVOPACKs with a capacity of 50 W to 400 W do not have built-in regenerative resistors. If the regenerative energy exceeds the specified value, connect an external regenerative resistor.

*3: Install an external regenerative resistor when using the SERVOPACK with capacity of 6.0 kW or more.
The following regenerative resistor can be used:
- JUSP-RA04: For SGDS-60A (Allowable power loss 180 W)
- JUSP-RA05: For SGDS-75A (Allowable power loss 350 W)

Ratings and Specifications

● Overload Characteristics

The overload detection level is set under hot start conditions at a servomotor surrounding air temperature of 40℃.

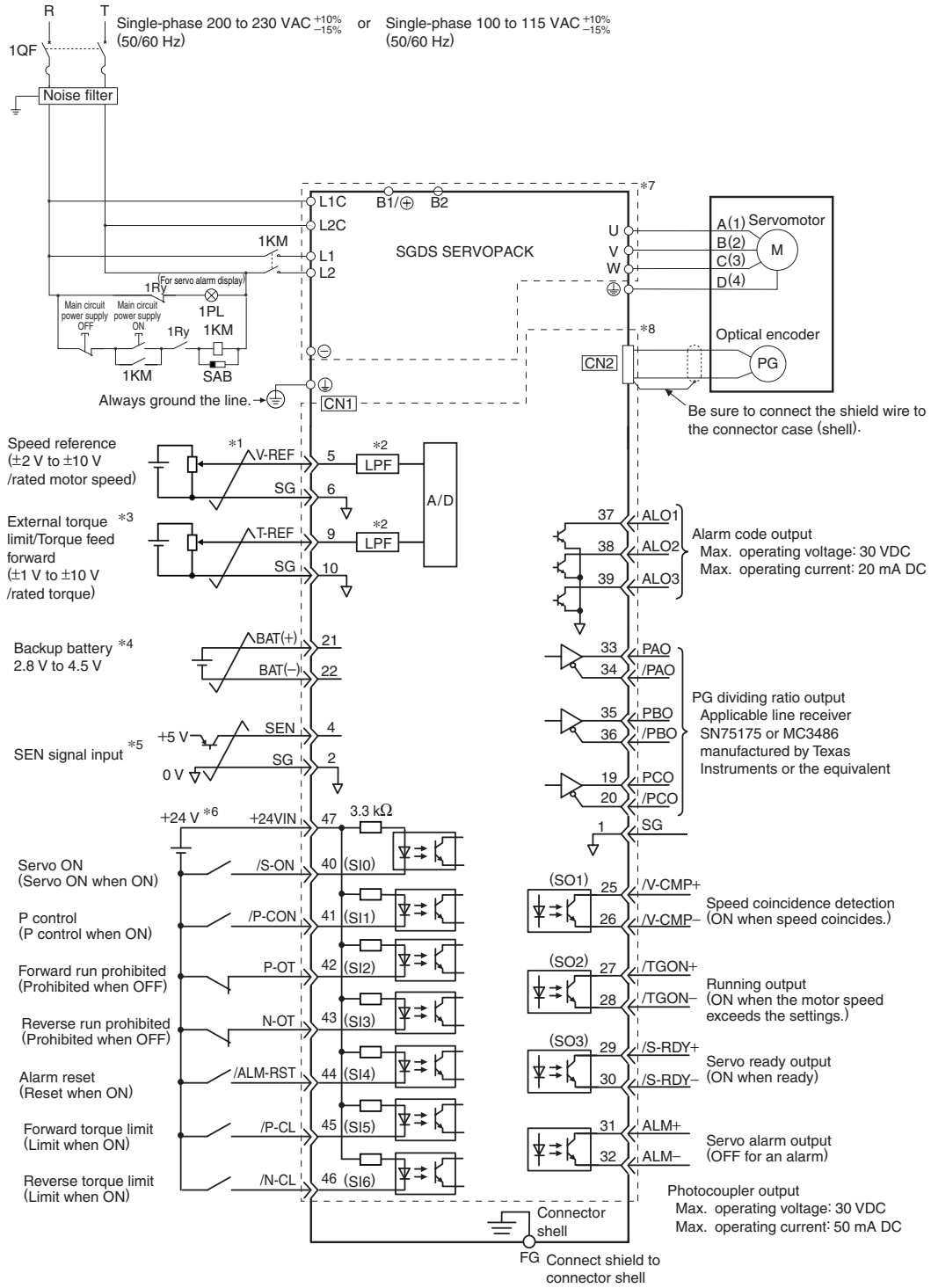


Note: The overload characteristics of A, B, and C in the figure are applicable when the SERVOPACK is combined with one of the following servomotors.

Graph Type	Servomotor Model					
	SGMMJ-	SGMAS-	SGMPS-	SGMSS-	SGMGH-	SGMCS-
A	A1 to A3	A5 to 04	01 to 04	—	—	02 to 35
B	—	06 to 12	08 to 15	10 to 30	03 to 30	45 to 2Z
C	—	—	—	40 to 70	40 to 75	—

Connection Examples

● Single-phase 100 VAC or 200 VAC Power Supply Speed Control



*1: represents twisted-pair wires.

*2: The time constant for the primary filter is 30 μs.

*3: Enabled by the parameter setting.

*4: Connect these terminals to a back-up battery using an external power supply if using an absolute encoder.
When an encoder cable with a battery case is used, do not connect a back-up battery.

*5: Connect when using an absolute encoder.

*6: Customers must purchase a 24-VDC power supply with double-shielded enclosure.

*7: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

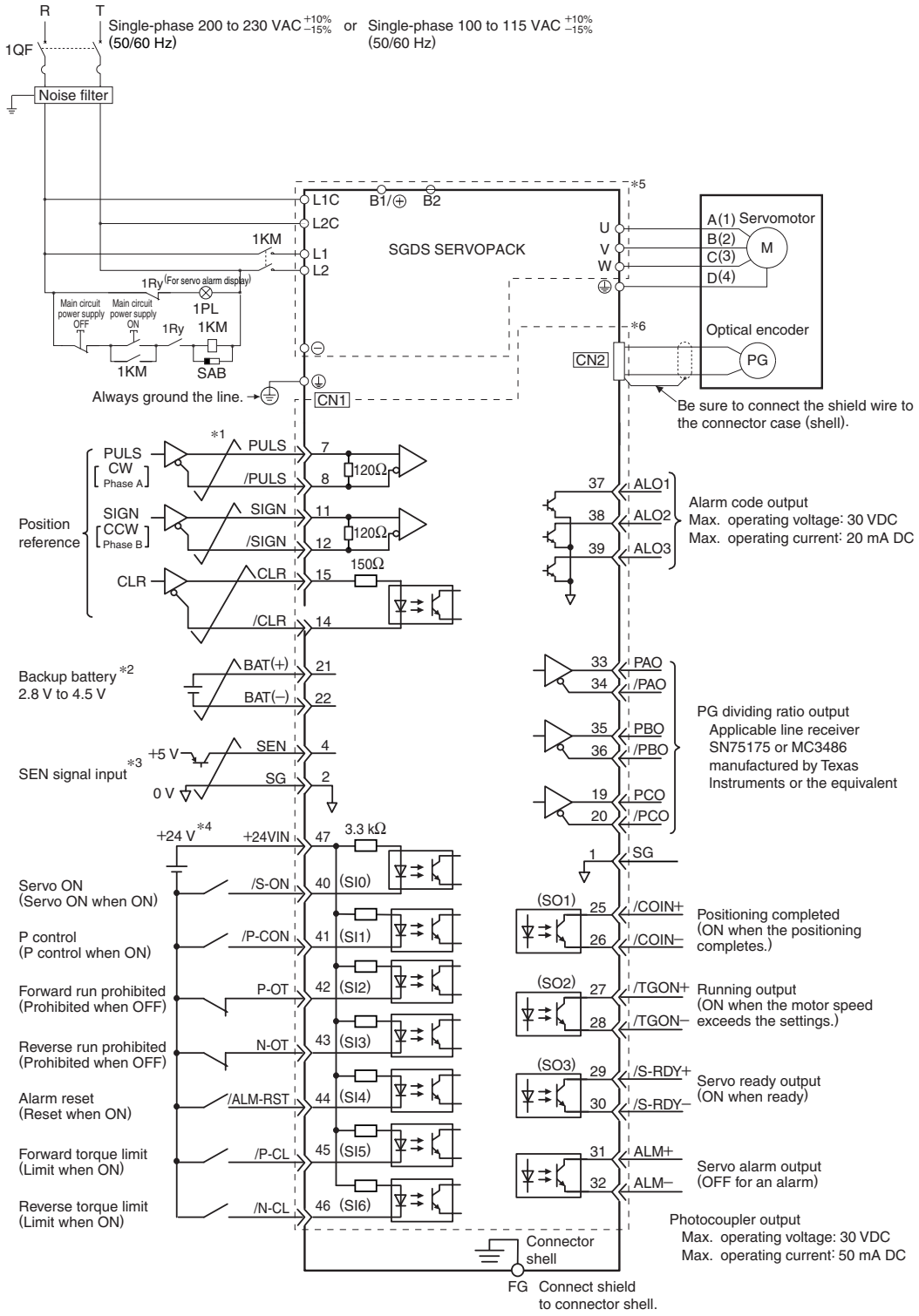
*8: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

Note: The functions allocated to the input terminals SI0 to SI6 and the output terminals SO1 to SO3 can be changed by using the parameters.

Connection Examples

- Single-phase 100 VAC or 200 VAC Power Supply

Position Control



*1: represents twisted-pair wires.

*2: Connect these terminals to a back-up battery using an external power supply if using an absolute encoder.
When an encoder cable with a battery case is used, do not connect a back-up battery.

*3: Connect when using an absolute encoder.

*4: Customers must purchase a 24-VDC power supply with double-shielded enclosure.

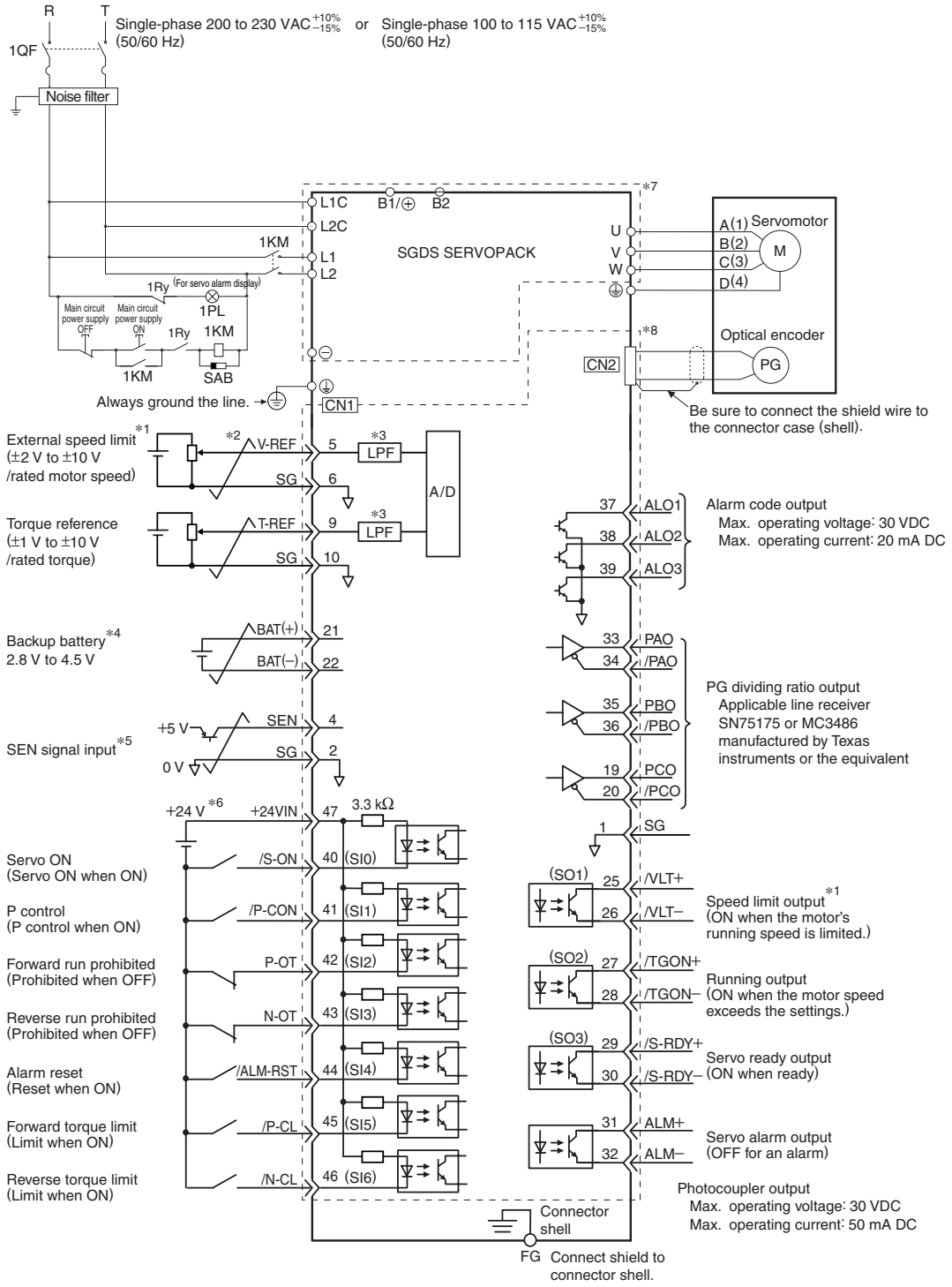
*5: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

*6: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

Note: The functions allocated to the input terminals SI0 to SI6 and the output terminals SO1 to SO3 can be changed by using the parameters.

Connection Examples

● Single-phase 100 VAC or 200 VAC Power Supply
Torque Control



∗1: Enabled by the parameter setting.

∗2: ⫽ represents twisted-pair wires.

∗3: The time constant for the primary filter is 30 μs.

∗4: Connect these terminals to a back-up battery using an external power supply if using an absolute encoder.
When an encoder cable with a battery case is used, do not connect a back-up battery.

∗5: Connect when using an absolute encoder.

∗6: Customers must purchase a 24-VDC power supply with double-shielded enclosure.

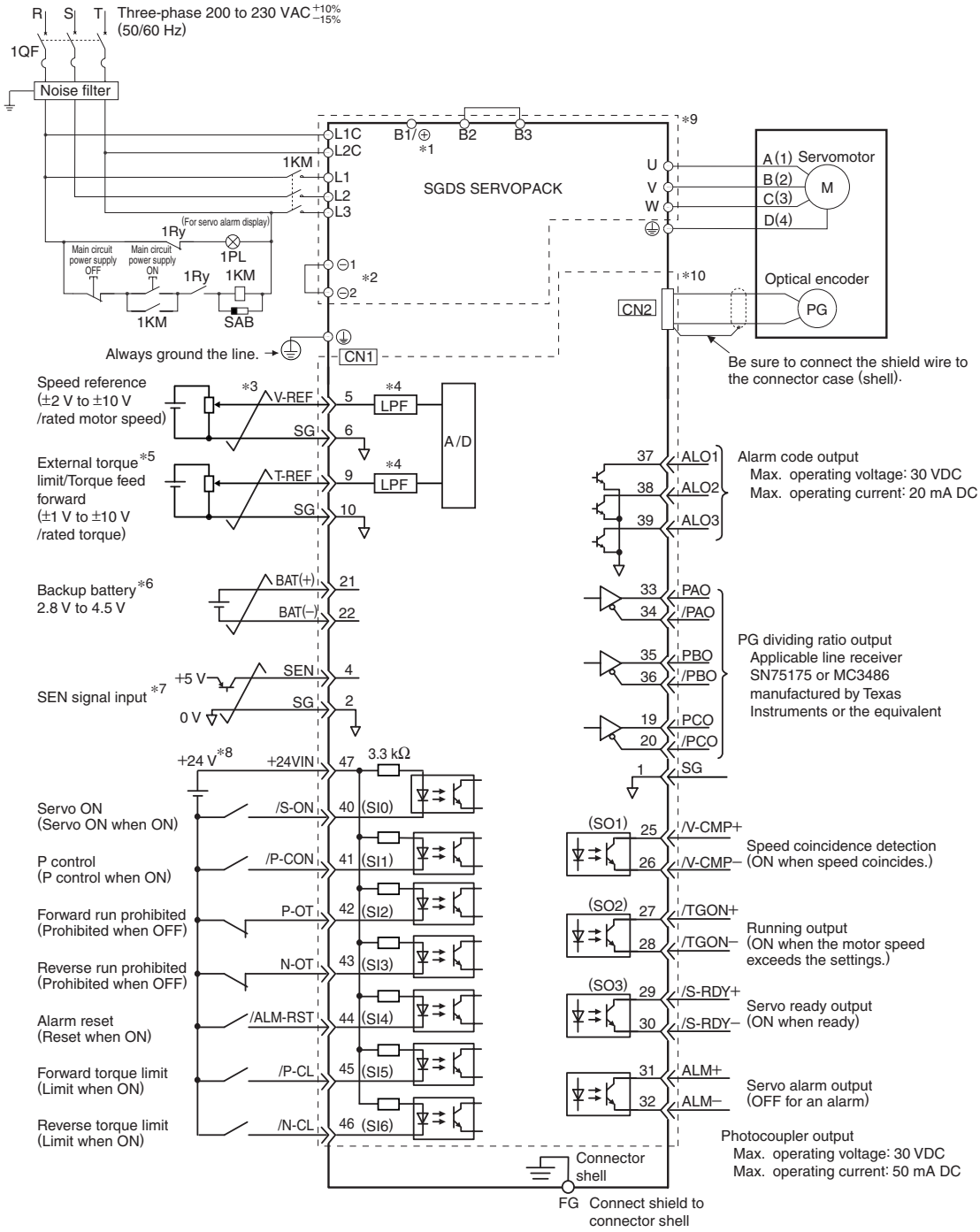
∗7: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

∗8: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

Note: The functions allocated to the input terminals SI0 to SI6 and the output terminals SO1 to SO3 can be changed by using the parameters.

Connection Examples

- Three-phase 200 VAC Power Supply
  Speed Control



*1: If an external regenerative resistor is required, disconnect the wiring between the SERVOPACK's B2 and B3 terminals and connect an external regenerative resistor between the B1/⊕ and B2 terminals or between the B1 and B2 terminals.

*2: Connect a DC reactor for harmonic suppression between the SERVOPACK's ⊖1 and ⊖ 2 terminals.

*3: ⩘ represents twisted-pair wires.

*4: The time constant for the primary filter is 30 μs.

*5: Enabled by the parameter setting.

*6: Connect these terminals to a back-up battery using an external power supply if using an absolute encoder.
When an encoder cable with a battery case is used, do not connect a back-up battery.

*7: Connect when using an absolute encoder.

*8: Customers must purchase a 24-VDC power supply with double-shielded enclosure.

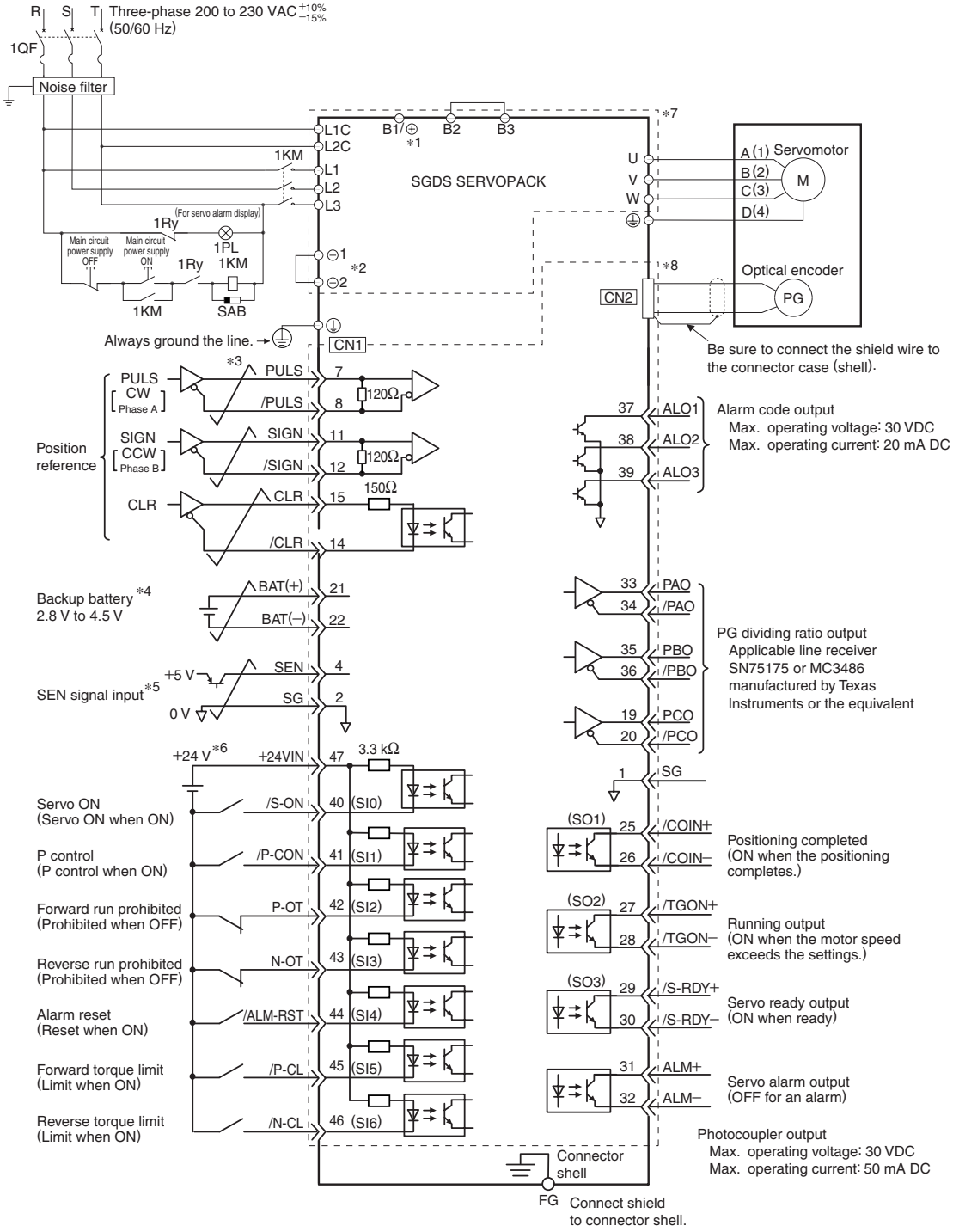
*9: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

*10: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

Note: The functions allocated to the input terminals SI0 to SI6 and the output terminals SO1 to SO3 can be changed by using the parameters.

Connection Examples

● Three-phase 200 VAC Power Supply
Position Control



*1: If an external regenerative resistor is required, disconnect the wiring between the SERVOPACK's B2 and B3 terminals and connect an external regenerative resistor between the B1/ ⊕ and B2 terminals or between the B1 and B2 terminals.

*2: Connect a DC reactor for harmonic suppression between the SERVOPACK's ⊖ 1 and ⊖ 2 terminals.

*3: ⩫ represents twisted-pair wires.

*4: Connect these terminals to a back-up battery using an external power supply if using an absolute encoder.
When an encoder cable with a battery case is used, do not connect a back-up battery.

*5: Connect when using an absolute encoder.

*6: Customers must purchase a 24-VDC power supply with double-shielded enclosure.

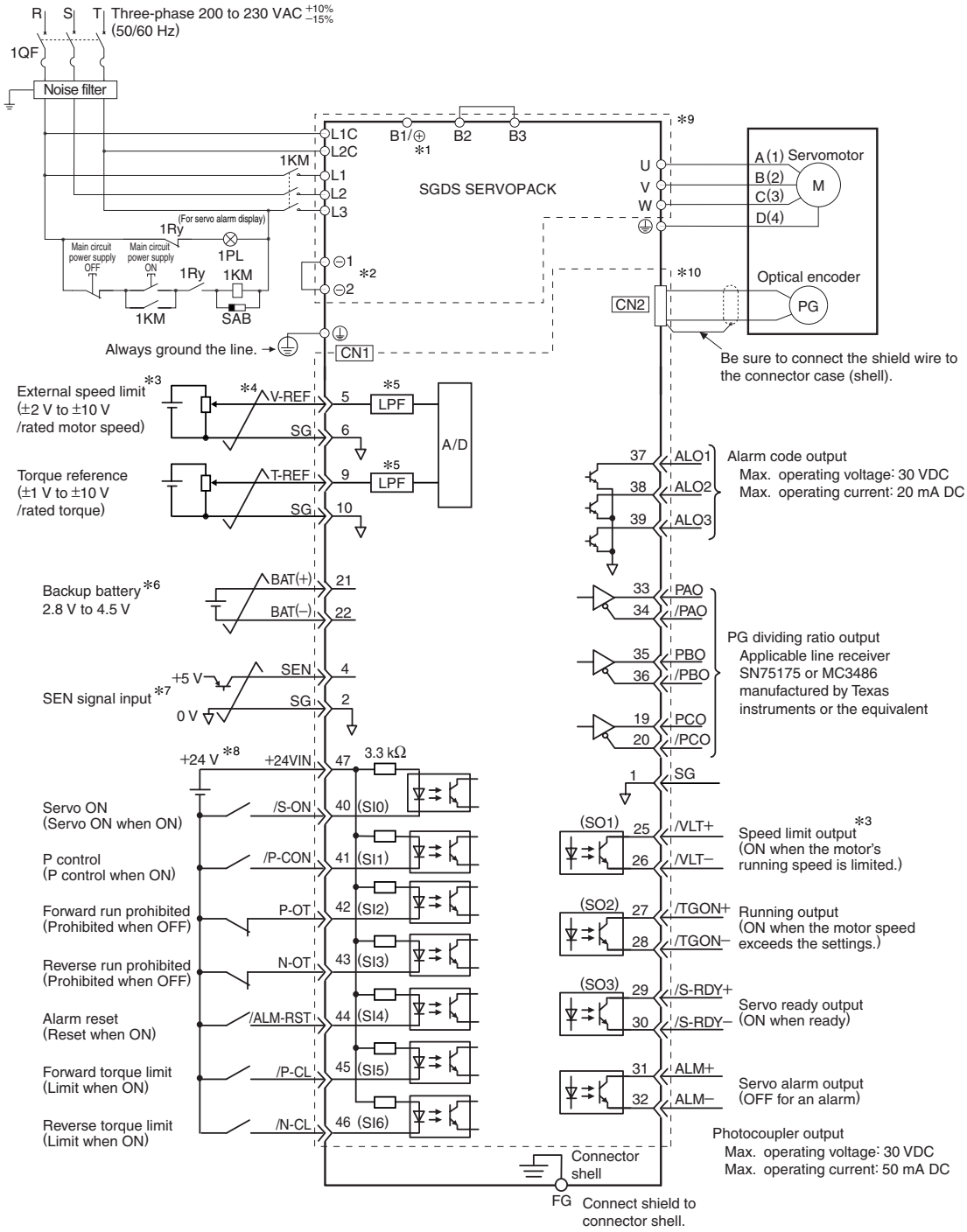
*7: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

*8: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

Note: The functions allocated to the input terminals SI0 to SI6 and the output terminals SO1 to SO3 can be changed by using the parameters.

Connection Examples

- Three-phase 200 VAC Power Supply
  Torque Control



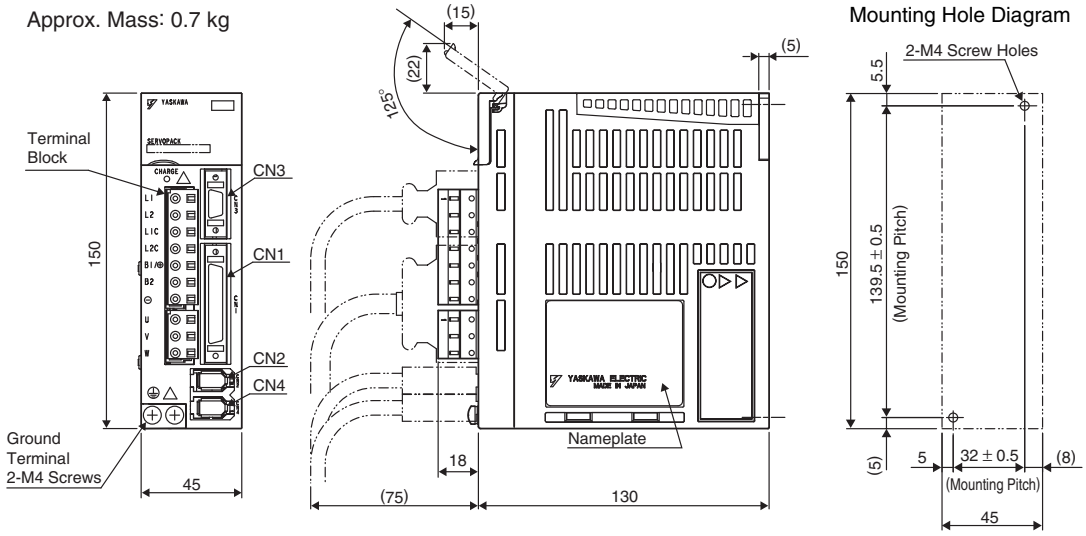
*1: If an external regenerative resistor is required, disconnect the wiring between the SERVOPACK's B2 and B3 terminals and connect an external regenerative resistor between the B1/⊕ and B2 terminals or between the B1 and B2 terminals.
*2: Connect a DC reactor for harmonic suppression between the SERVOPACK's ⊖1 and ⊖ 2 terminals.
*3: Enabled by the parameter setting.
*4: ⌒ represents twisted-pair wires.
*5: The time constant for the primary filter is 30 μs.
*6: Connect these terminals to a back-up battery using an external power supply if using an absolute encoder.
When an encoder cable with a battery case is used, do not connect a backup battery.
*7: Connect when using an absolute encoder.
*8: Customers must purchase a 24-VDC power supply with double-shielded enclosure.
*9: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.
*10: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.
Note: The functions allocated to the input terminals SI0 to SI6 and the output terminals SO1 to SO3 can be changed by using the parameters.

External Dimensions Units: mm

- Base-mounted SERVOPACKs

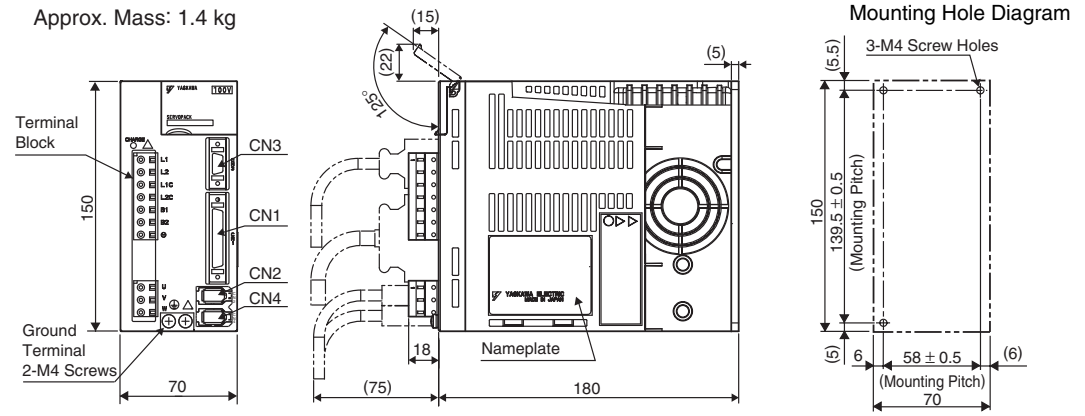
(1) Single-phase 100 V: 30 W
Single-phase 100 / 200 V: 50 W to 200 W

Approx. Mass: 0.7 kg



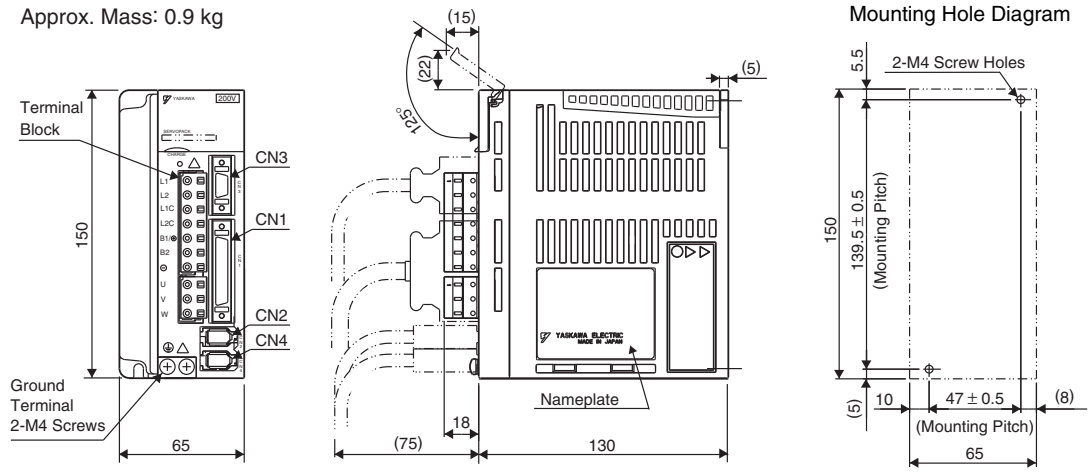
(2) Single-phase 100 V: 400 W

Approx. Mass: 1.4 kg



(3) Single-phase 200 V: 400 W

Approx. Mass: 0.9 kg

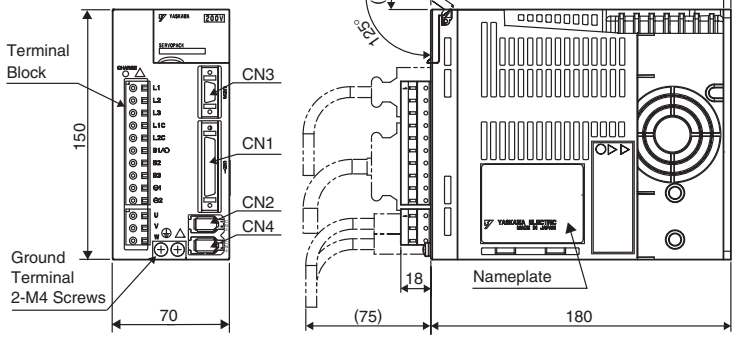


External Dimensions Units: mm

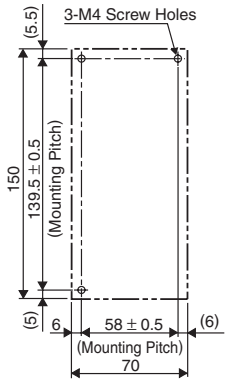
(4) Single-phase 200 V: 750 W
Three-phase 200 V: 500 W, 1.0 kW

Note: Do not use the L3 terminal of the single-phase 200 V, 750 W SERVOPACK.

Approx. Mass: 1.4 kg

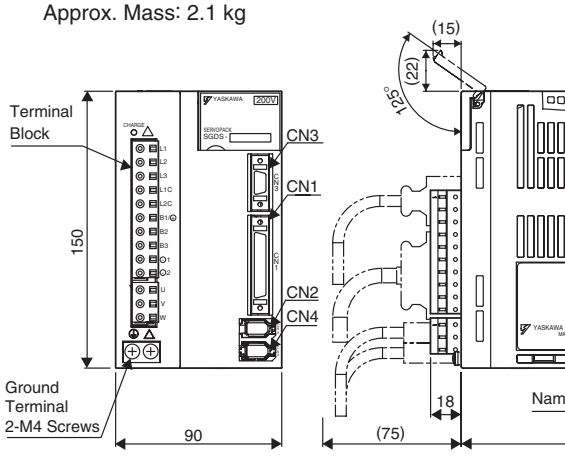


Mounting Hole Diagram

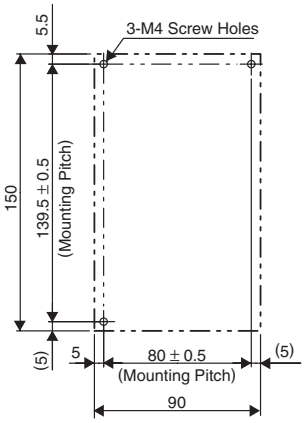


(5) Three-phase 200 V: 1.5 kW

Approx. Mass: 2.1 kg

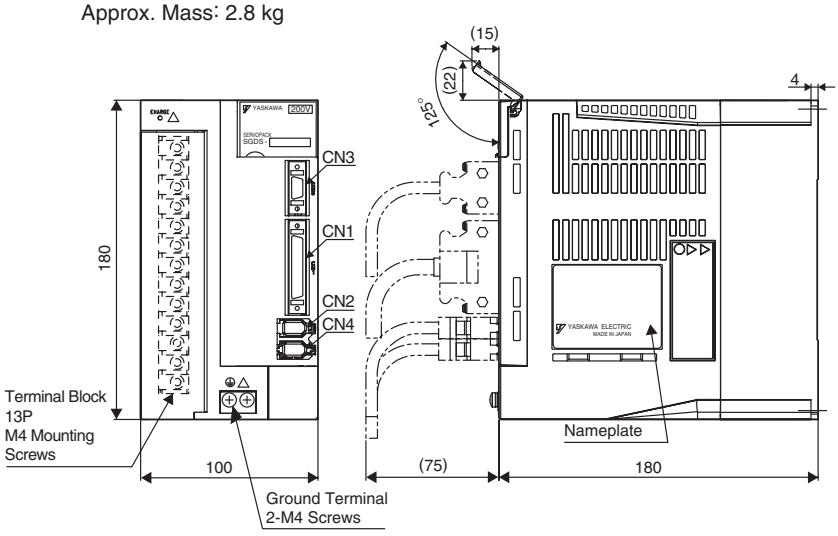


Mounting Hole Diagram

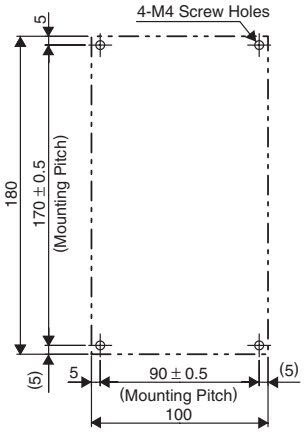


(6) Three-phase 200 V: 2,0 kW, 3.0 kW

Approx. Mass: 2.8 kg



Mounting Hole Diagram



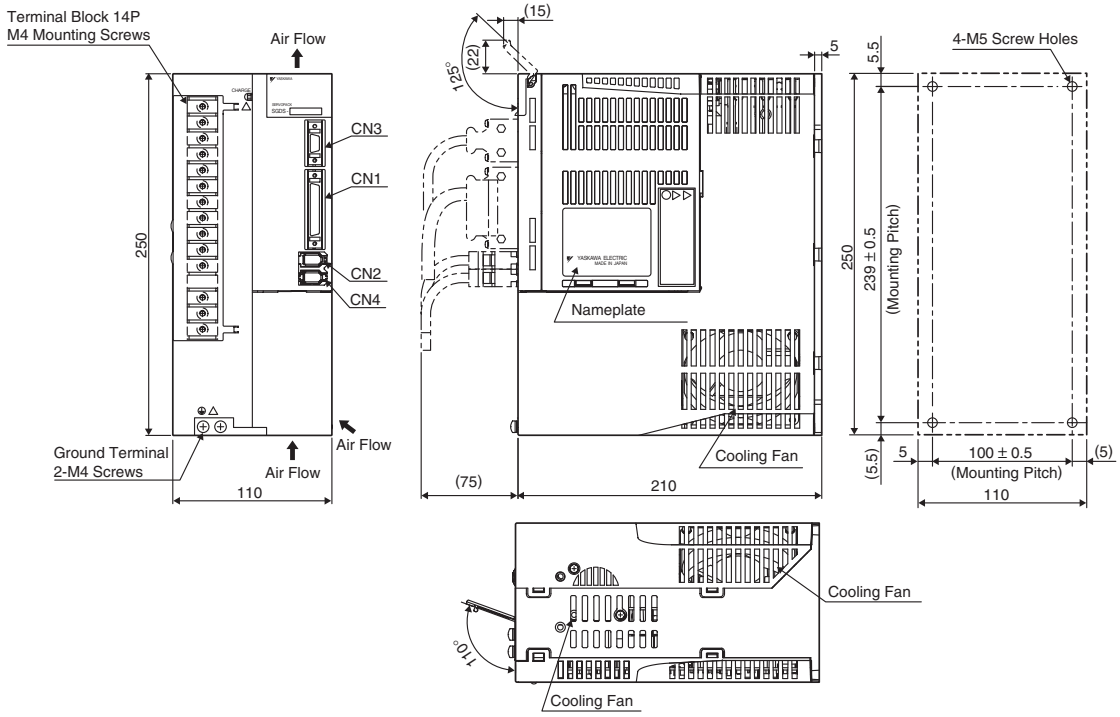
External Dimensions Units: mm

● Base-mounted SERVOPACKs

(7) Three-phase 200 V: 5.0 kW

Approx. Mass: 5.0 kg

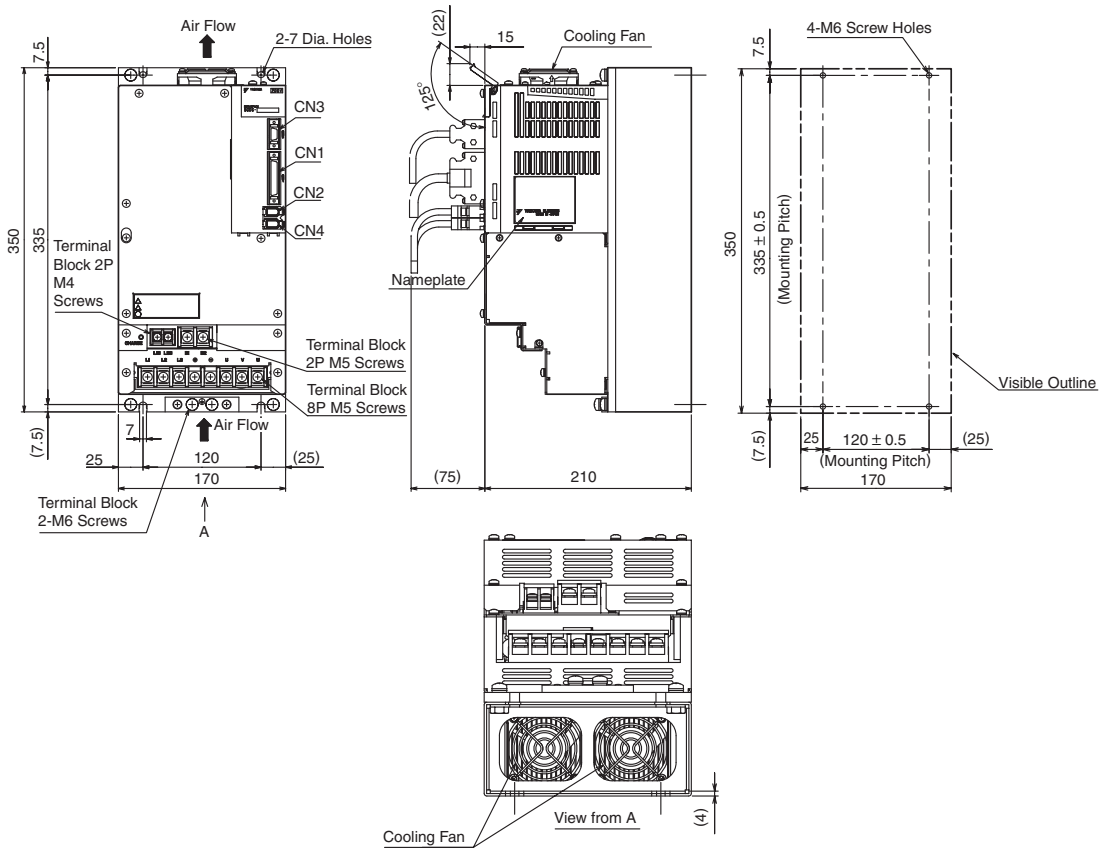
Mounting Hole Diagram



(8) Three-phase 200 V: 6.0 kW, 7.5 kW

Approx. Mass: 10.5 kg

Mounting Hole Diagram



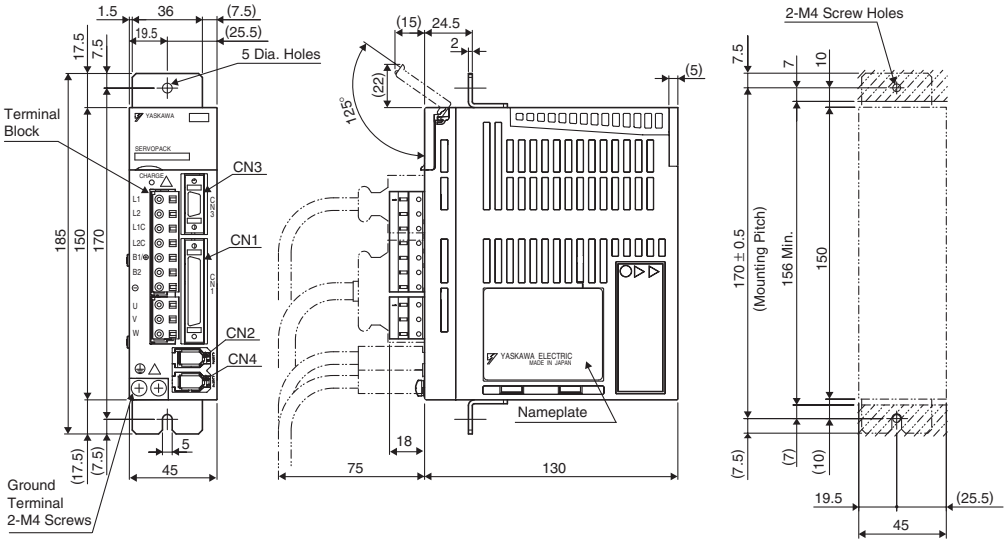
External Dimensions Units: mm

- Rack-mounted SERVOPACKs

(1) Single-phase 100/200 V: 50 W to 200 W

Approx. Mass: 0.7 kg

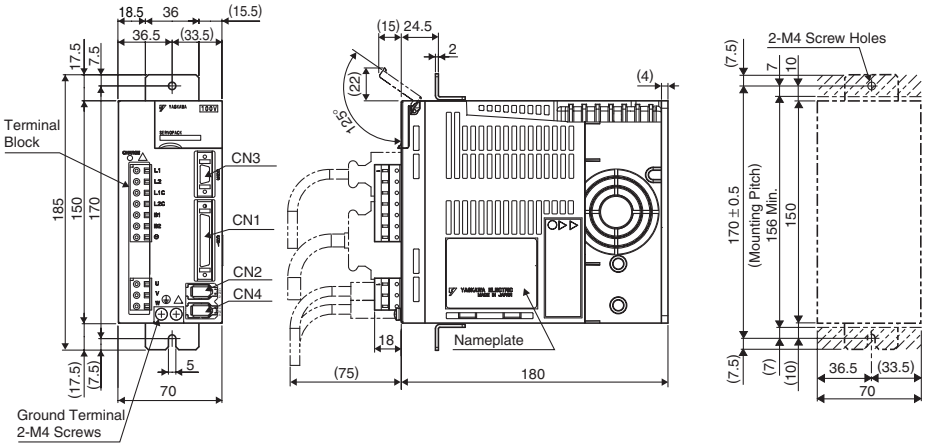
Mounting Hole Diagram



(2) Single-phase 100 V: 400 W

Approx. Mass: 1.4 kg

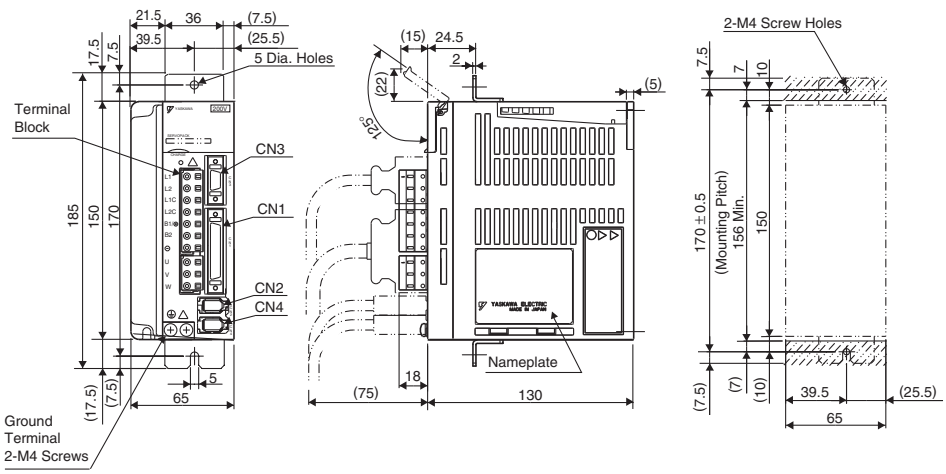
Mounting Hole Diagram



(3) Single-phase 200 V: 400 W

Approx. Mass: 0.9 kg

Mounting Hole Diagram



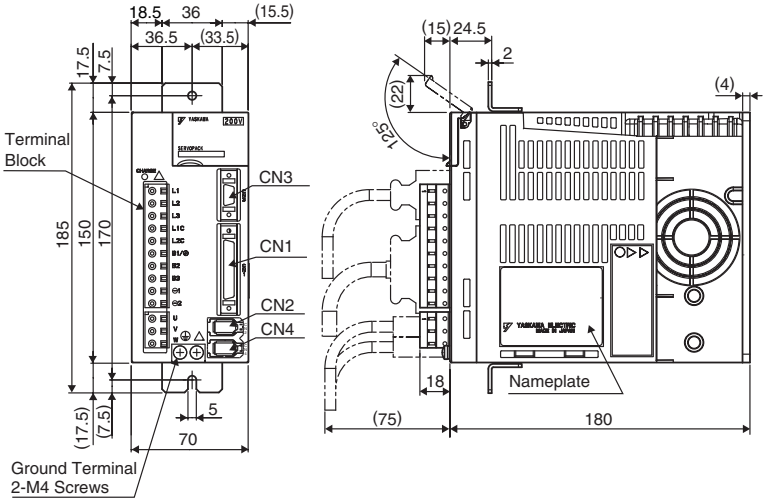
External Dimensions Units: mm

● Rack-mounted SERVOPACKs

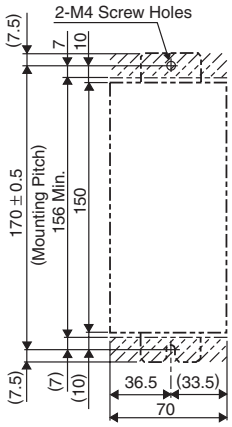
(4) Single-phase 200 V: 750 W
Three-phase 200 V: 500 W, 1.0 kW

Note: Do not use the L3 terminal of the single-phase 200 V, 750 W SERVOPACK.

Approx. Mass: 1.4 kg

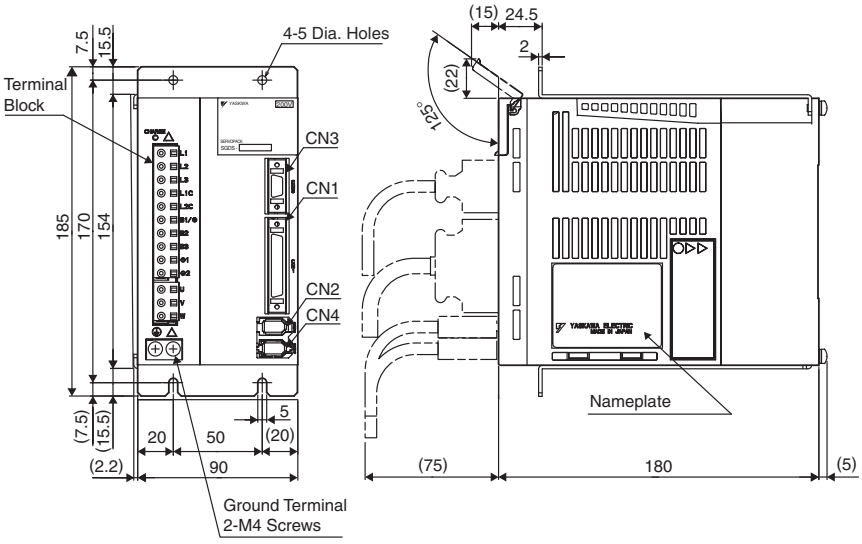


Mounting Hole Diagram

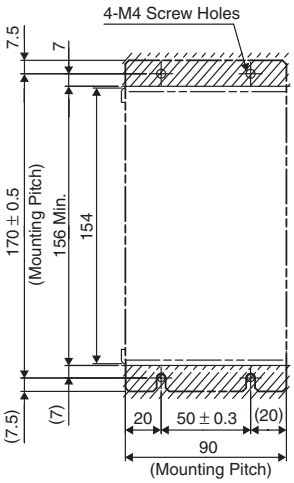


(5) Three-phase 200 V: 1.5 kW

Approx. Mass: 2.4 kg



Mounting Hole Diagram

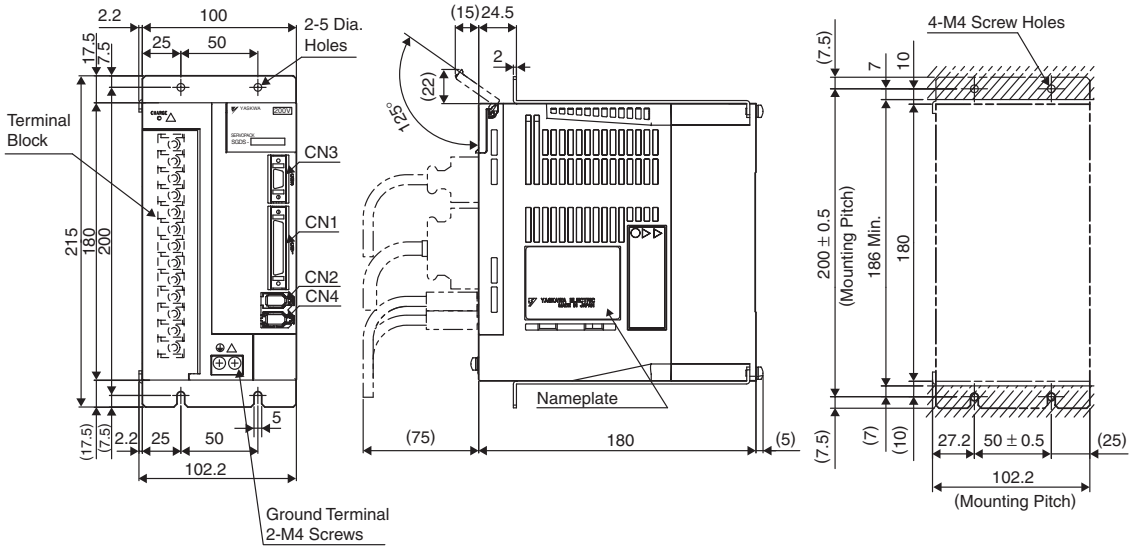


External Dimensions Units: mm

(6) Three-phase 200 V: 2.0 kW, 3.0 kW

Approx. Mass: 3.1 kg

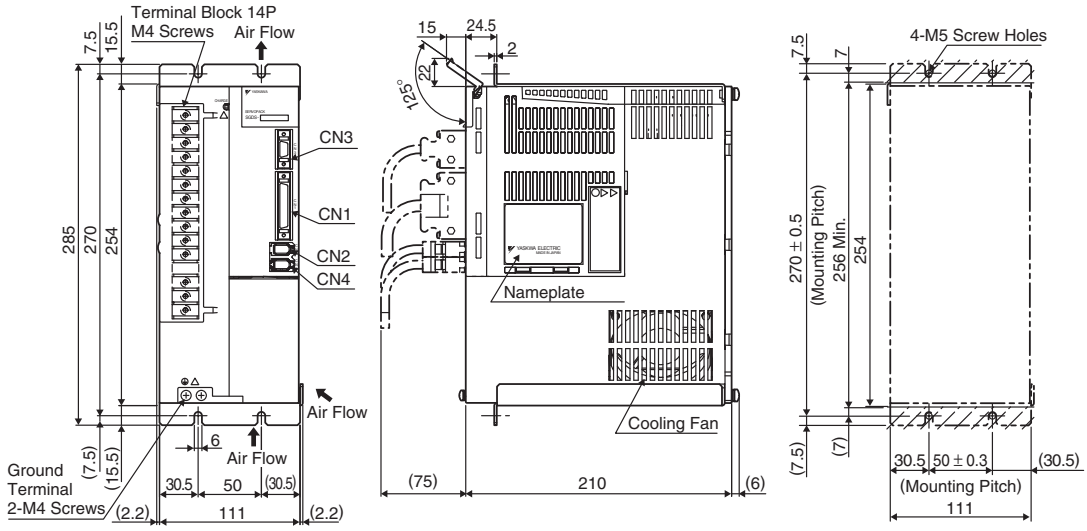
Mounting Hole Diagram



(7) Three-phase 200 V: 5.0 kW

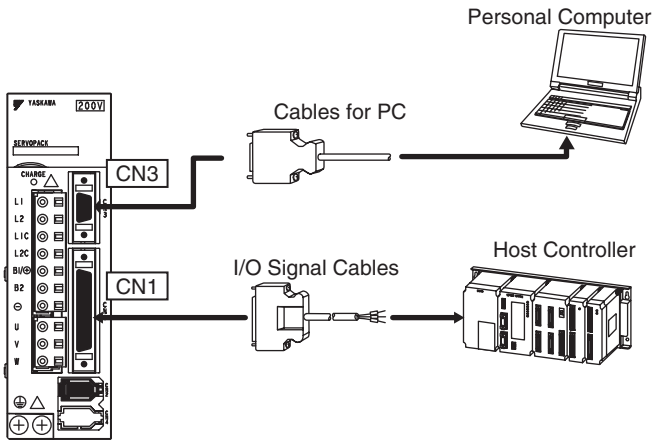
Approx. Mass: 5.3 kg

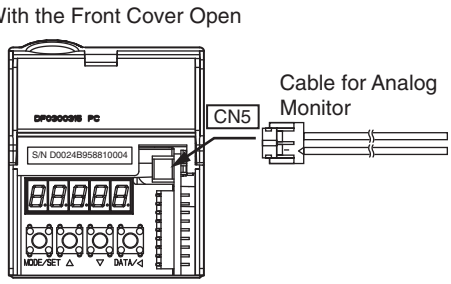
Mounting Hole Diagram

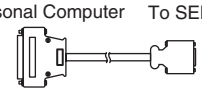


Selecting Cables

- Cable Connections to CN1 , CN3 , and CN5



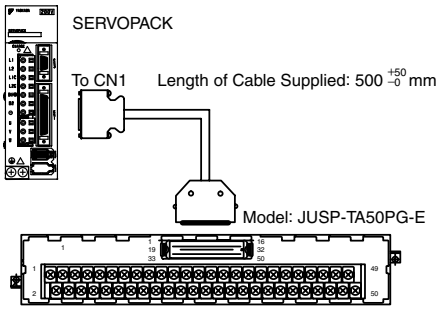


Name		Length	Order No.	Specifications	Details
To CN1 I/O Signal Cables	Connector Terminal Block Converter Unit		JUSP-TA50PG-E	Terminal Block Converter Unit and 0.5 m Connection Cable 	(1)
	Cable with Loose Wires at One End	1 m	JZSP-CSI01-1-E	Cable with Connector to SERVOPACK and Loose Wires 	(2)
		2 m	JZSP-CSI01-2-E		
		3 m	JZSP-CSI01-3-E		
	Connector Kit for CN1		JZSP-CSI9-1-E	Connector and Case	(3)
To CN3 Cables for PC		2 m	JZSP-CMS01-E	D-Sub 25-pin (for PC98) To Personal Computer To SERVOPACK 	(4)
		2 m	JZSP-CMS02-E	D-Sub 9-pin (for DOS/V) To Personal Computer To SERVOPACK 	(5)
		2 m	JZSP-CMS03-E	Half-pitch 14-pin (for PC98) To Personal Computer To SERVOPACK 	(6)
To CN5 Cable for Analog Monitor		1 m	JZSP-CA01-E	To SERVOPACK 	(7)

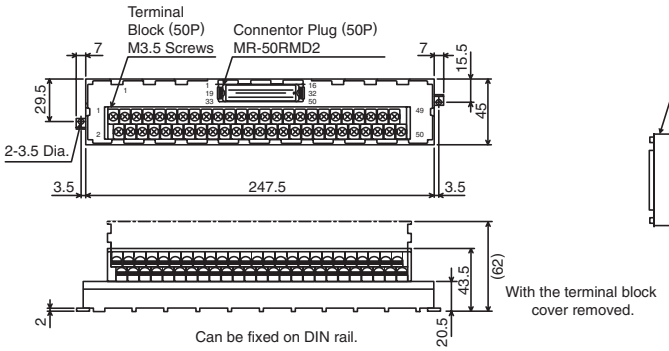
Selecting Cables Units: mm

(1) Connector Terminal Block Converter Unit (to CN1)

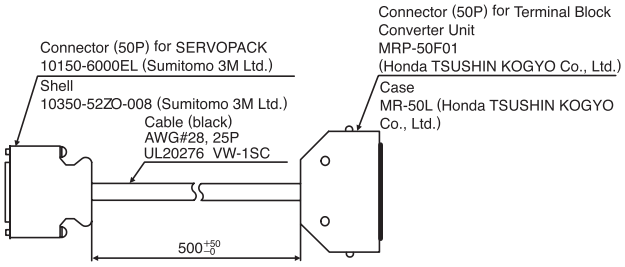
・Cable Connection



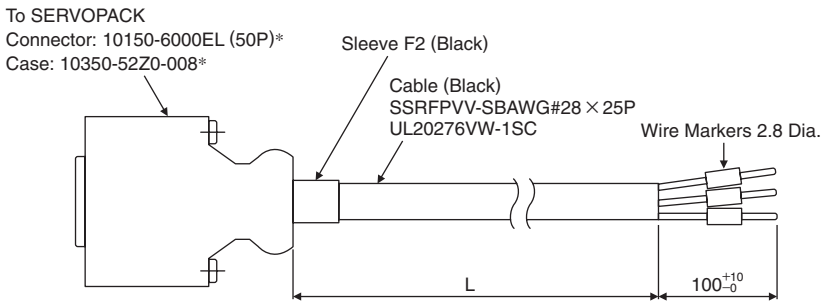
・Dimensional Drawings of Terminal Block



・Dimensional Drawings of Cable



(2) Cable with SERVOPACK end Connector and Loose Wires (to CN1)



*: Manufactured by Sumitomo 3M Ltd.

Note: See the next page for the connection diagram.

(2) Cable with Loose Wires at One End (to CN1)

・Connection Diagram of JZSP-CSI01-□ Cable

To SERVOPACK

Pin No.	Signal Name	Lead Color	Marking		Lead Marker
			Color	Dots	
1	SG	Orange	Red	1	1
3	–	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	–	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	–	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				

To Host Controller

: represents twisted-pair wires.

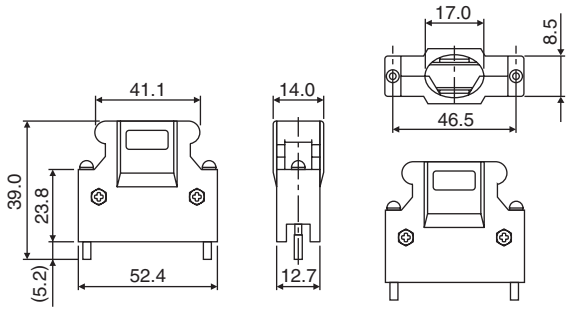
(3) Connector Kit (for CN1)

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

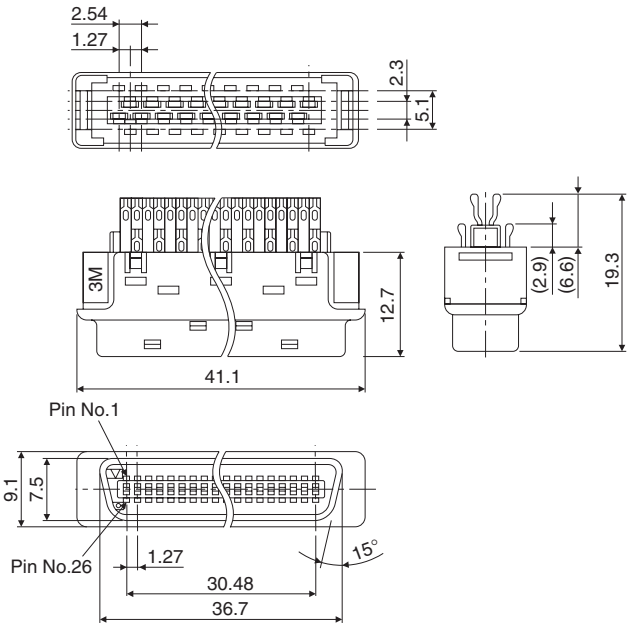
Connector Kit Model No.	Case		Connector	
	Model No.	Qty	Model No.	Qty
JZSP-CSI9-1	10350-52Z0-008*	1 set	10150-3000PE* (Soldered)	1

*: Manufactured by Sumitomo 3M Ltd.

・Dimensional Drawings of Case



・Dimensional Drawings of Connector

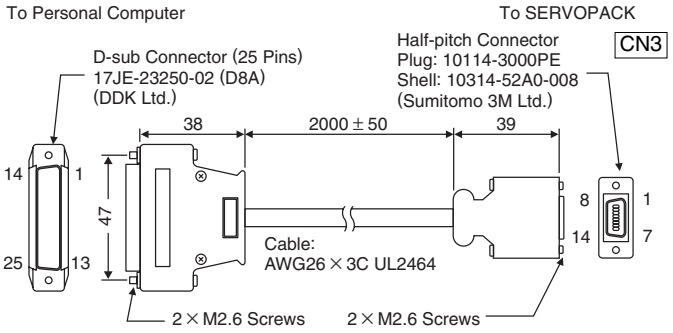


・Cable Size

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

Selecting Cables Units: mm

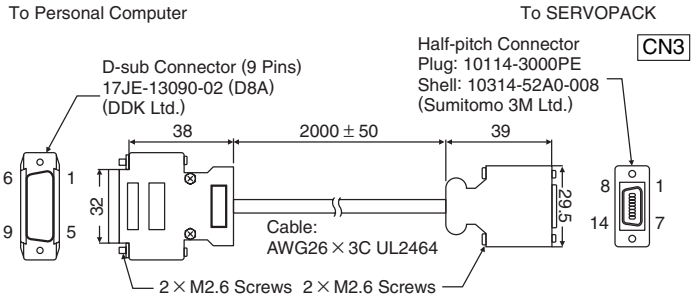
(4) Cable with 25-pin Connector for NEC PC-98 Series Personal Computer (to CN3)



To Personal Computer		To SERVOPACK	
Signal	Pin No.	Pin No.	Signal
RXD	3	2	/TXD
TXD	2	4	/RXD
0V	7	14	0V
RTS	4		
CTS	5		
FG	1	Case	FG

Shield Wire

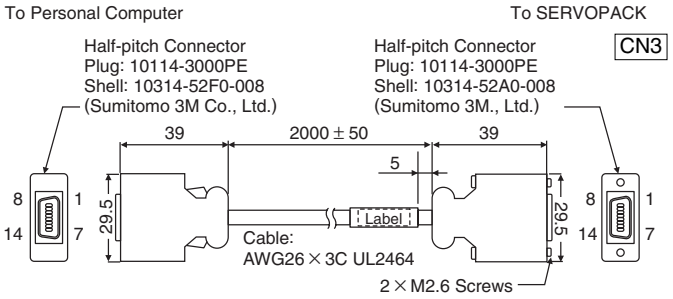
(5) Cable for DOS/V (to CN3)



To Personal Computer		To SERVOPACK	
Signal	Pin No.	Pin No.	Signal
RXD	2	2	/TXD
TXD	3	4	/RXD
0V	5	14	0V
RTS	7		
CTS	8		
FG	Cace	Case	FG

Shield Wire

(6) Cable with 14-pin Half-pitch Connector for NEC PC-98 Series Personal Computer (to CN3)

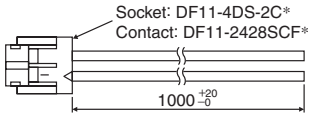


To Personal Computer		To SERVOPACK	
Signal	Pin No.	Pin No.	Signal
RXD	1	2	TXD
TXD	9	4	RXD
RTS	10		
CTS	4		
GND	14	14	GND
FG	12	Case	FG
FG	Case		

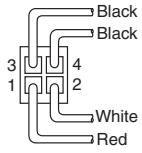
Shield Wire

(7) Cables for Analog Monitor (to CN5)

・Dimensional Drawings



*: Manufactured by Hirose Electric Corporation.



View from Cable End

・Specifications

Cable Color	Signal Name	Remarks
White	Analog Monitor 1	Torque reference: 1 V/100% rated torque
Red	Analog Monitor 2	Motor speed: 1 V/1000 min^{-1}
Black (2 Cables)	GND	GND Analog monitor: 0 V

Selecting Cables

● Main Circuit Cables

(1) Single-phase for 100 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-			
		A3B	A5F	01F	02F
Main Circuit Power Input Terminals	L1, L2	HIV1.25			HIV2.0
Servomotor Connection Terminals	U, V, W	HIV1.25			
Control Power Input Terminals	L1C, L2C	HIV1.25			
External Regenerative Resistor Connection Terminals	B1 / ⊕, B2	HIV1.25			
Ground Terminal	⏚	HIV2.0 min.			

(2) Single-phase for 200 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-				
		A5A	01A	02A	04A	08A
Main Circuit Power Input Terminals	L1, L2	HIV1.25			HIV2.0	
Servomotor Connection Terminals	U, V, W	HIV1.25				
Control Power Input Terminals	L1C, L2C	HIV1.25				
External Regenerative Resistor Connection Terminals	B1 / ⊕, B2	HIV1.25				
Ground Terminal	⏚	HIV2.0 min.				

(3) Three-phase for 200 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-							
		05A	10A	15A	20A	30A	50A	60A	75A
Main Circuit Power Input Terminals	L1, L2, L3	HIV2.0			HIV3.5		HIV5.5	HIV8.0	HIV14
Servomotor Connection Terminals	U, V, W	HIV2.0			HIV3.5	HIV5.5	HIV8.0	HIV14	
Control Power Input Terminals	L1C, L2C	HIV1.25							
External Regenerative Resistor Connection Terminals	B1 / ⊕, B2*	HIV1.25			HIV2.0	HIV3.5	HIV5.5	HIV8.0	
Ground Terminal	⏚	HIV2.0 min.							

*: For SGDS-60A and -75A SERVOPACKs, the external regenerative resistor connection terminals are B1 and B2.

The table shows the wire size and allowable current for three cables. Use a cable whose specifications meet or are less than the values in the table.

・600 V Heat-resistant Vinyl Cable (HIV)

AWG Size	Nominal Cross Section Diameter mm²	Configuration Number of Wires/mm²	Conductive Resistance Ω/km	Allowable Current at Surrounding Air Temperatures A		
				30℃	40℃	50℃
20	0.5	19/0.18	39.5	6.6	5.6	4.5
—	0.75	30/0.18	26.0	8.8	7.0	5.5
18	0.9	37/0.18	24.4	9.0	7.7	6.0
16	1.25	50/0.18	15.6	12.0	11.0	8.5
14	2.0	7/0.6	9.53	23	20	16
12	3.5	7/0.8	5.41	33	29	24
10	5.5	7/1.0	3.47	43	38	31
8	8.0	7/1.2	2.41	55	49	40
6	14.0	7/1.6	1.35	79	70	57

Note: The values in the table are only for reference.

IMPORTANT

1 Wire sizes are selected for three cables per bundle at 40℃ surrounding air temperature with the rated current.
2 Use cable with minimum withstand voltage of 600 V for main circuits.
3 If cables are bundled in PVC or metal ducts, consider the reduction ratio of the allowable current.
4 Use heat-resistant cable under high ambient or panel temperatures where normal vinyl cable will rapidly deteriorate.
5 Use cable within the allowable moment of inertia.
6 Do not use cables in continuous regenerating status.

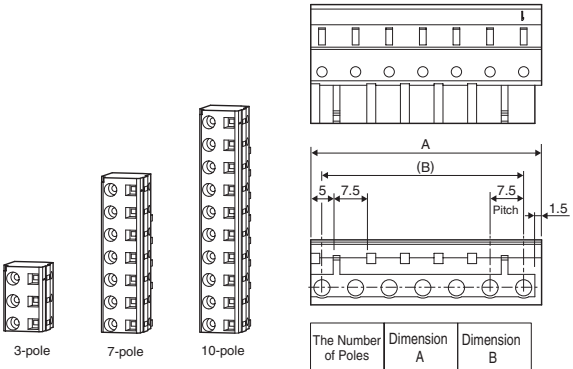
Selecting Cables Units: mm

● Connectors of Main Circuit and Control Power Supply Cables and Servomotor Cable (Standard: Spring Type)

・Connector Types

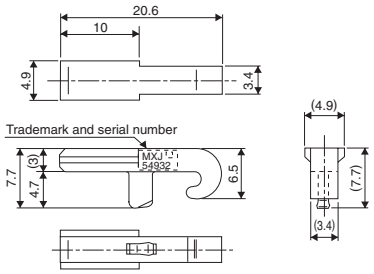
Appearance	Model No.	Manufacturer
3-pole (For servomotor main circuit cable connector to SERVOPACK)	51446-0301	Molex Japan Co., Ltd.
7-pole (For 50 W to 400 W SERVOPACKs)	51446-0701	
10-pole (For 0.5 kW to1.5 kW SERVOPACKs)	51446-1001	
Connection lever	54932-0000	

・ External View and Dimensions



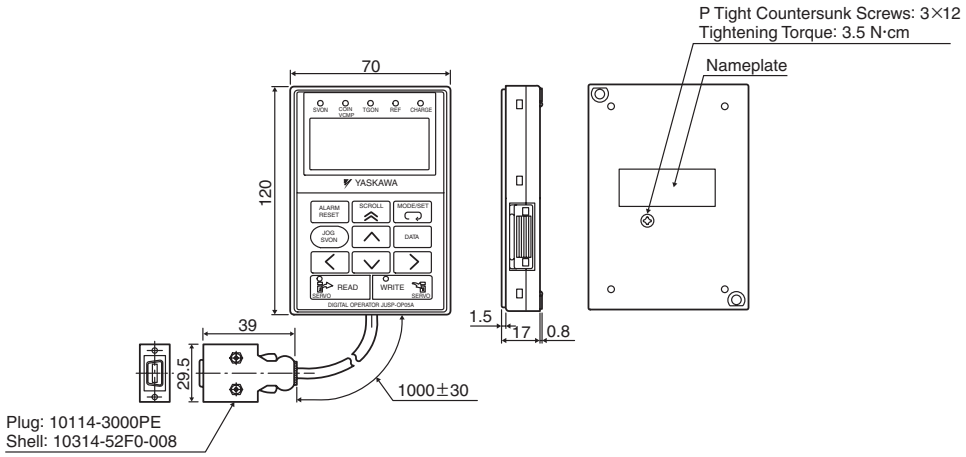
The Number of Poles	Dimension A	Dimension B
3	21.5	15
7	51.5	45
10	74	67.5

・Connection Lever



Selecting Peripheral Devices Units: mm

● Digital Operator (Model: JUSP-OP05A)

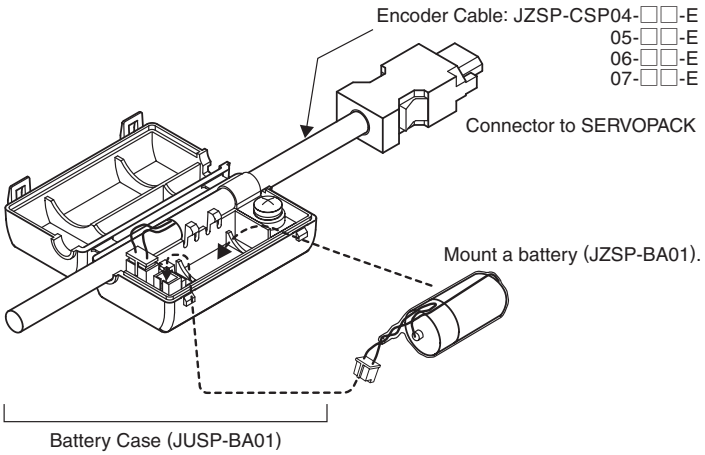


● Battery Case (Model: JUSP-BA01)

IMPORTANT

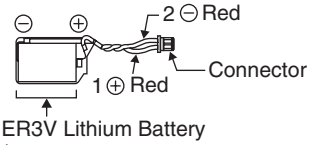
1 The battery case (JUSP-BA01) is not provided with a battery. A battery must be purchased separately.

2 Install the battery case where the surrounding air temperature is between 0℃ to 55℃.



(1) Mounting a Battery in a Battery Case

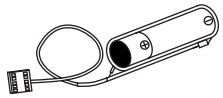
Prepare a lithium battery (JZSP-BA01) and mount in a battery case.



ER3V Lithium Battery
(3.6 V, 1000 mAh, manufactured by Toshiba Battery Co., Ltd.)

(2) Connecting a Battery to the Host Controller

Use a battery that meets the specifications of the host controller. Use an ER6VC3N (3.6 V, 2000 mAh, manufactured by Toshiba Battery Co., Ltd.) or equivalent battery.



Selecting Peripheral Devices

● Molded-case Circuit Breaker and Fuse Capacity

Main Circuit Power Supply	SERVOPACK Model		Power Supply Capacity per SERVOPACK kVA	Current Capacity of Molded-case Circuit Breaker or Fuse *1, *2		Inrush Current	
	Capacity kW	SGDS-		Main Circuit Power Supply Arms	Control Circuit Power Supply Arms	Main Circuit Power Supply A	Control Circuit Power Supply A
Single-phase 100 V	0.03	A3B	0.25	4	0.26	14	30
	0.05	A5F					
	0.10	01F	0.40				
	0.20	02F	0.60	6			
	0.40	04F	1.2	12			
Single-phase 200 V	0.05	A5A	0.25	4	0.13	28	60
	0.10	01A	0.40				
	0.20	02A	0.75				
	0.40	04A	1.2	8			
	0.80	08A	2.2	16			
Three-phase 200 V	0.5	05A	1.4	4	0.15	28	60
	1.0	10A	2.3	7			
	1.5	15A	3.2	10			28
	2.0	20A	4.3	13			
	3.0	30A	5.9	17			
	5.0	50A	7.5	28		57	
	6.0	60A	12.5	32	0.27	94	
	7.5	75A	15.5	41			

*1: Nominal value at the rated load. The specified derating is required to select an appropriate fuse capacity.
*2: Cut-off characteristics (25℃): 200% for two seconds min. and 700% for 0.01 seconds min.
Note: Do not use a fast-acting fuse. Because the SERVOPOACK's power supply is a capacitor input type, a fast-acting fuse may blow when the power is turned on.

If selecting a molded-case circuit breaker, observe the following precautions.

IMPORTANT

■Ground Fault Detector
- Select ground fault detectors for inverters.
- High-frequency current leaks from the servomotor armature because of switching operation inside the SERVOPACK.

(1) Maximum Input Current

- The instantaneous maximum output of the SERVOPACK is approximately 3 times the rated output for a maximum of 3 seconds. Accordingly, select a molded-case circuit breaker whose breaking time is 5 seconds or more at 300% of SERVOPACK rated current. The general-purpose low-speed acting molded-case circuit breakers are applicable.
- The power supply capacity per SERVOPACK when using a servomotor is described in the table above. Select a molded-case circuit breaker with the capacity larger than the effective load current (when using multiple SERVOPACKs) calculated from the total power supply capacity .
- The consumption of other controllers must be considered when selecting a molded-case circuit breaker.

(2) Inrush Current

- Refer to the table above for SERVOPACK inrush current.
- The allowable inrush current for a low-speed acting molded-case circuit breaker is approximately 10 times of the rated current for 0.02 seconds.
- When turning on multiple SERVOPACKs simultaneously, select a molded-case circuit breaker with the allowable current for 20 ms larger than the total inrush current shown in the table above.

Selecting Peripheral Devices

● Noise Filters, Magnetic Contactors, Surge Absorbers, and AC/DC Reactors

Main Circuit Power Supply	SERVOPACK Model		Recommended Noise Filter		Magnetic Contactor	Surge Absorber	AC/DC Reactor
	Capacity (kW)	SGDS-	Model No.	Specifications			
Single-phase 100 V	0.03	A3B	FN2070-6/07	Single-phase 250 VAC, 6 A	SC-03	R·C·M -601BQZ-4	X5052
	0.05	A5F					X5053
	0.10	01F					
	0.20	02F	FN2070-10/07	Single-phase 250 VAC, 10 A			X5054
	0.40	04F	FN2070-16/07	Single-phase 250 VAC, 16 A	SC-4-1		X5056
Single-phase 200 V	0.05	A5A	FN2070-6/07	Single-phase 250 VAC, 6 A	SC-03		X5052
	0.10	01A					
	0.20	02A					X5053
	0.40	04A	FN2070-10/07	Single-phase 250 VAC, 10 A			X5054
	0.80	08A	FN2070-16/07	Single-phase 250 VAC, 16 A	SC-4-1		X5056
Three-phase 200 V	0.5	05A	FN258L-7/07	Three-phase 480 VAC, 7 A	SC-03	R·C·M -601BUZ-4	X5061
	1.0	10A	FN258L-16/07	Three-phase 480 VAC, 16 A	SC-4-1		
	1.5	15A					X5060
	2.0	20A			SC-5-1		
	3.0	30A	FN258L-30/07	Three-phase 480 VAC, 30 A			X5059
	5.0	50A	FMAC-0934-5010	Three-phase 480 VAC, 50 A	SC-N1		X5068
	6.0	60A		Three-phase 440 VAC, 50 A			—
	7.5	75A	FMAC-0953-6410	Three-phase 440 VAC, 64 A	SC-N2		—
Details			(1)		(2)	(3)	(4)

Notes: 1 If some SERVOPACKs are wired at the same time, select the proper magnetic contactors accroding to the total capacity.
2 The following table shows the manufacturers of each device.

Peripheral Device	Manufacturer
Noise Filter	FN type: Schaffner EMC, Inc.
	FMAC type: Schurter, Inc. (formerly Timonta)
Magnetic Contactor	Fuji Electric FA Components & Systems Co., Ltd.
Surge Absorber	Okaya Electric Industries Co., Ltd. (Surge Protector)
AC/DC Reactor	Yaskawa Controls Co., Ltd.

IMPORTANT

■Noise Filter for Brake Power Supply

Use the following noise filter at the brake power input for 400 W or less servomotors with holding brakes.

Model No.: FN2070-6/07 (Manufactured by Schaffner EMC, Inc.)

Selecting Peripheral Devices

● Regenerative Resistors and Brake Power Supply Units

Main Circuit Power Supply	SERVOPACK Model		Regenerative Resistor			Brake Power Supply Unit
	Capacity kW	SGDS-	Built-in		Externally connected	
			Resistance Ω	Capacity W		
Single-phase 100 V	0.03	A3B	None	None	—	For 24 VDC brakes*3 To be provided by the customer.
	0.05	A5F				For 24 VDC brakes*3 To be provided by the customer.
	0.10	01F				
	0.20	02F				
	0.40	04F				
Single-phase 200 V	0.05	A5A	None	None	—	For 90 VDC brakes ·LPDE-1H01-E for 100 VAC input ·LPSE-2H01-E for 200 VAC input
	0.10	01A				
	0.20	02A				
	0.40	04A				
	0.80	08A	50	60		
Three-phase 200 V	0.45	05A	50	40	—	
	1.0	10A		60		
	1.5	15A	20	50		
	2.0	20A	12	80		
	3.0	30A				
	5.0	50A	8	180	—	
	6.0	60A	(6.25)*1	(880)*1	JUSP-RA04	
	7.5	75A	(3.13)*2	(1760)*2	JUSP-RA05	
Details			(5)			(6)

*1: For the optional JUSP-RA04 Regenerative Resistor Unit.
*2: For the optional JUSP-RA05 Regenerative Resistor Unit.
*3: If using a commercially available power supply for the 24-VDC brake, install a surge suppressor to protect the power supply from overvoltage. If a surge suppressor is not used, the power supply may be damaged if an overvoltage, such as a surge, occurs in the output section.

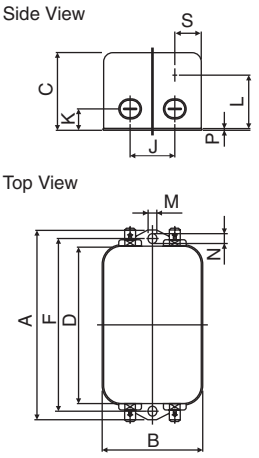
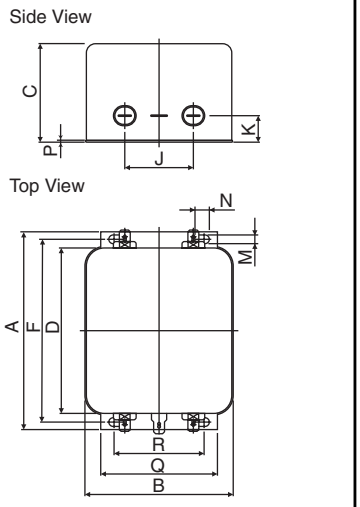
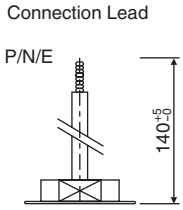
Notes: 1 If the SERVOPACK cannot process the regenerative power, an external regenerative resistor is required. External regenerative resistors are required for SERVOPACKs with a capacity of 6.0 kW or more as a standard safety measure.
2 The following table shows the manufacturers of each device.

Peripheral Device	Manufacturer
External Regenerative Resistor	Iwaki Wireless Research Institute
External Regenerative Unit	Yaskawa Electric Corporation
Brake Power Supply Unit	Yaskawa Controls Co., Ltd.

(1) Noise Filter

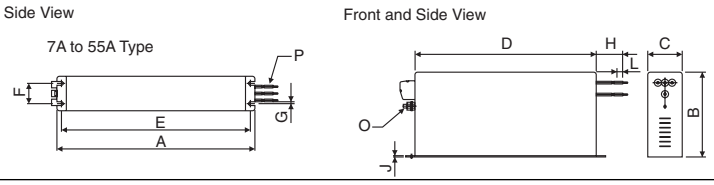
The recommended noise filter is manufactured by Schaffner EMC, Inc. (FN type) and Schurter, Inc. (formerly Timonta) (FMAC type).

• FN Type for Single-phase 100/200 V

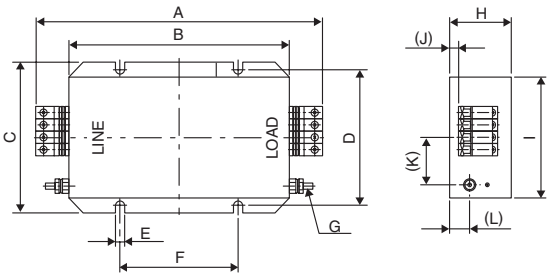
Model No.		FN2070-6/07	FN2070-10/07	FN2070-16/07
Dimensional Drawings				
				
External Dimensions	Symbol	Dimensions in mm		
	A	113.5±1	156±1	119±0.5
	B	57.5±1		85.5±1
	C	45.4±1.2		57.6±1
	D	94±1	130.5±1	98.5±1
	F	103±0.3	143±0.3	109±0.3
	J	25±0.2		40±0.2
	K	8.4±0.5		8.6±0.5
	L	32.4±0.5		–
	M	4.4±0.1	5.3±0.1	4.4±0.1
	N	6±0.1		7.4±0.1
	P	0.9±0.1		1.2±0.1
	Q	–		66±0.3
	R	–		51±0.2
	S	38±0.5		–
Specifications		250 VAC, 6 A	250 VAC, 10 A	250 VAC, 16 A
Applicable SERVOPACK SGDS-	Single-phase 100 V	A5F	02F	04F
		01F		
	Single-phase 200 V	A5A	04A	08A
		01A		
		02A		
Manufacturer		Schaffner EMC, Inc.		

Selecting Peripheral Devices

・FN Type for Three-phase 200 V

Model No.		FN258L-7/07	FN258L-16/07	FN258L-30/07
Dimensional Drawings				
External Dimensions	Symbol	Dimensions in mm		
	A	225±1	305±1	335±1
	B	126±0.8	142±0.8	150±1
	C	50±0.6	55±0.6	60±0.6
	D	225±0.8	275±0.8	305±1
	E	240±0.5	290±0.5	320±0.5
	F	25±0.3	30±0.3	35±0.3
	G	6.5±0.2		
	H	300±10		400±10
	J	1±0.1		
	L	9±1		
	O	M5		
	P	AWG 16	AWG 14	AWG 10
Specifications		480 VAC, 7 A	480 VAC, 16 A	480 VAC, 30 A
Applicable SERVOPACK SGDS-	Three-phase 200 V	05A	10A, 15A, 20A	30A
Manufacturer		Schaffner EMC, Inc.		

・FMAC Type for Three-phase 200 V

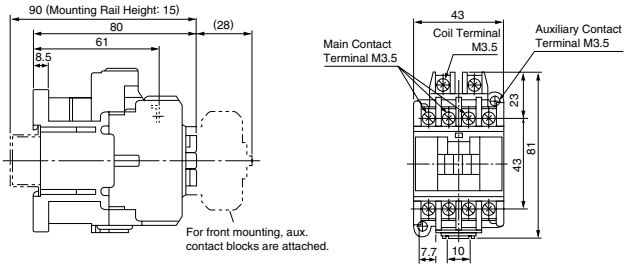
Model		FMAC-0934-5010	FMAC-0953-6410
Dimensional Drawings			
External Dimensions	Symbol	Dimensions in mm	
	A	251	308
	B	201	231
	C	151	151
	D	135^{+0}_{-1}	135^{+0}_{-1}
	E	6.5±0.3	6.5±0.3
	F	115±0.3	115±0.3
	G	M6	M6
	H	66	66
	I	121	121
	J	(10)	(13)
	K	(41)	(45)
	L	(17)	(34)
Specifications		440 VAC, 50 A	440 VAC, 64 A
Applicable SERVOPACK SGDS-	Three-Phase 200 V	50A 60A	75A
Manufacturer		Schurter, Inc. (formerly Timonta)	

(2) Magnetic Contactor

A magnetic contactor is required to externally activate the AC power for the SERVOPACK.
Be sure to attach a surge absorber to the excitation coil of the magnetic contactor.

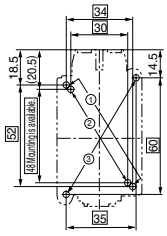
• Model: SC-03

External Dimensions



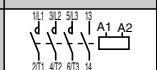
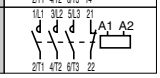
Approx. Mass: 0.32 kg

Mounting Hole Dimensions



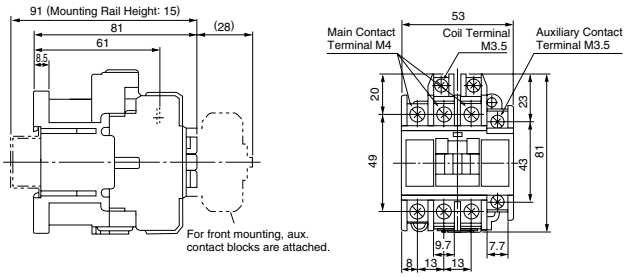
●Mounting methods: The following methods ①, ②, ③ are available.
①··· 34 × (48 to) 52
②··· 30 × 48
③··· 35 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

Terminal Symbols

Auxiliary Contact	Structure
1a	
1b	

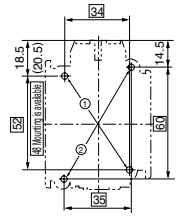
• Model: SC-4-1

External Dimensions



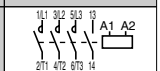
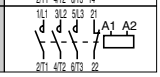
Approx. Mass: 0.36 kg

Mounting Hole Dimensions



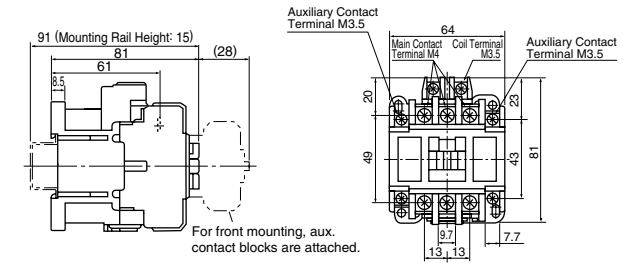
●Mounting methods: The following methods ①, ② are available.
①··· 34 × (48 to) 52
②··· 35 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

Terminal Symbols

Auxiliary Contact	Structure
1a	
1b	

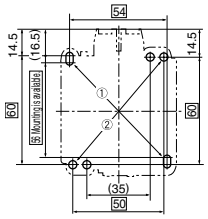
• Model: SC-5-1

External Dimensions



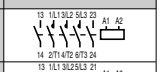
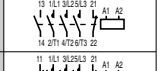
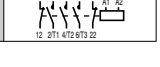
Approx. Mass: 0.38 kg

Mounting Hole Dimensions



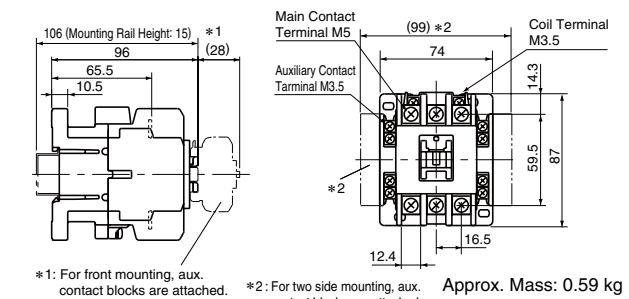
●Mounting methods: The following methods ①, ② are available.
①··· 54 × (56 to) 60
②··· 50 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

Terminal Symbols

Auxiliary Contact	Structure
2a	
1a1b	
2b	

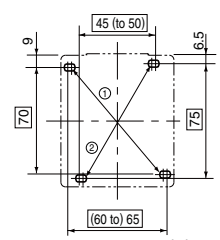
• Model: SC-N1, SC-N2

External Dimensions



Approx. Mass: 0.59 kg

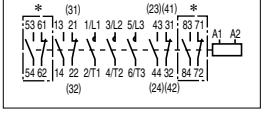
Mounting Hole Dimensions



●Mounting methods: The following methods ①, ② are available.
①··· (60 to) 65 × 70
②··· 45 (to 50) × 75
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

Terminal Symbols

Structure



∗: These contacts are used if the auxiliary contacts consist of four normally open (NO) and four normally close (NC) contacts.

Note: The terminals of the auxiliary contacts are numbered differently than conventional terminals. The numbers in parentheses use the conventional method.

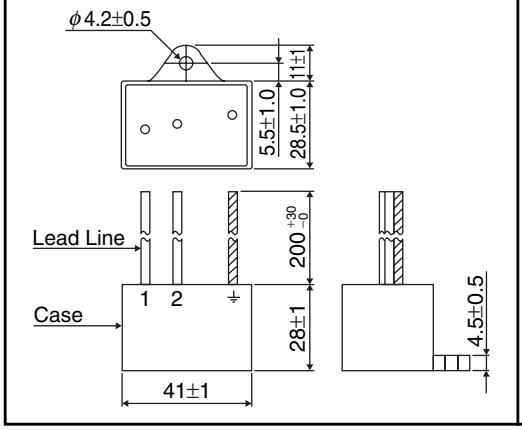
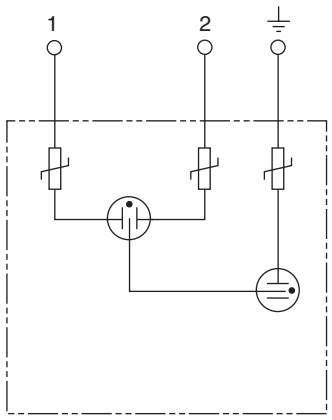
Selecting Peripheral Devices

Units: mm

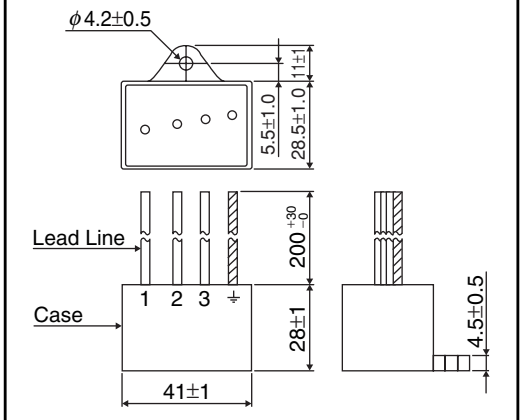
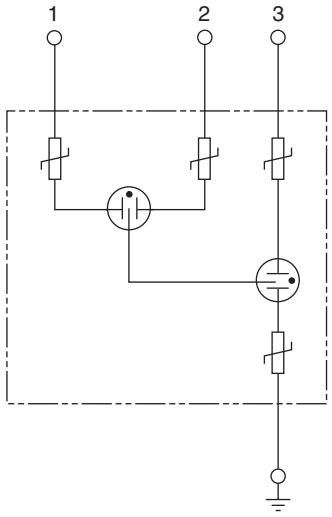
(3) Surge Absorber

The surge absorber absorbs switching surge and prevents faulty operation in or damage to electronic circuits. Recommended surge absorbers (for lightning surge) are listed below.

・Model: R・C・M-601BQZ-4

Dimensional Drawings	Internal Connection Diagram
	

・Model: R・C・M-601BUZ-4

Dimensional Drawings	Internal Connection Diagram
	

(4) AC/DC Reactors for Power Supply Harmonic Suppression

Manufactured by Yaskawa Controls Co., Ltd. Contact your Yaskawa representative for details.

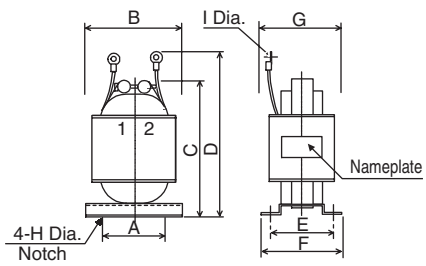
If the power supply harmonic suppression is needed, connect an AC reactor to the AC line for the single-phase input, or connect a DC reactor between the SERVOPACK main circuit terminals ⊖1 and ⊖2 for the three-phase input.

Select a reactor that matches the ratings of the SERVOPACK.

• Specifications

Applicable SERVOPACK Model SGDS-		AC/DC Reactor Model	Reactor Specifications	
			Inductance mH	Rated Current A
Single-phase 100 V	A3B	X5052	45.0	1.0
	A5F	X5053	20.0	2.0
	01F			
	02F	X5054	5.0	3.0
	04F	X5056	2.0	5.0
Single-phase 200 V	A5A	X5052	45.0	1.0
	01A			
	02A	X5053	20.0	2.0
	04A	X5054	5.0	3.0
	08A	X5056	2.0	5.0
Three-phase 200 V	05A	X5061	2.0	4.8
	10A			
	15A	X5060	1.5	8.8
	20A			
	30A	X5059	1.0	14.0
	50A	X5068	0.47	26.8
	60A	—	—	—
	75A			

• Dimensional Drawings



Reactor Model	Dimensions in mm									Approx. Mass kg
	A	B	C	D	E	F	G	H	I	
X5052	35	52	80	95	30	40	45	4	4.3	0.4
X5053	35	52	90	105	35	45	50	4	4.3	0.6
X5054	35	52	80	95	30	40	45	4	4.5	0.4
X5056	35	52	80	95	30	40	45	4	4.3	0.4
X5059	50	74	125	140	35	45	60	5	5.3	1.1
X5060	40	59	105	125	45	60	65	4	4.3	1.0
X5061	35	52	80	95	35	45	50	4	4.3	0.5
X5068	50	74	125	155	53	66	75	5	6.4	1.9

Selecting Peripheral Devices

Units: mm

(5) External Regenerative Resistor

When regenerative energy is so large that a SERVOPACK cannot process, install externally a regenerative resistor. The regenerative resistor must be provided by the customers. Refer to the table below for selecting the regenerative resistor.

SERVOPACK Capacity	Necessity of External Regenerative Resistors	Descriptions
400 W or Less	Not Required	No built-in regenerative resistor is provided, however, normally an external regenerative resistor is not required. Install external regenerative resistors when the smoothing capacitor in SERVOPACK cannot process all the regenerative power.
0.5 kW to 5.0 kW	Not Required	A built-in regenerative resistor is provided as standard. Install external regenerative resistors when the built-in regenerative resistor cannot process all the regenerative power.
6.0 kW to 7.5 kW	Required	No built-in regenerative resistor is provided, so the external regenerative resistor is required, If the external regenerative resistor is not connected with the SERVOPACK, the alarm A.300 is detected as a regeneration error alarm.

①Example: External Regenerative Resistor (by Iwaki Musen Kenkyusho Co., Ltd.)

Regenerative Resistor Model	Specifications
RH120	70 W, 1 to 100Ω
RH150	90 W, 1 to 100Ω
RH220	120 W, 1 to 100Ω
RH330C	200 W, 1 to 10kΩ
RH500	300 W, 1 to 30Ω

・Specifications

Resistance Tolerance	K: ±10%, J: ±5%, H: ±3%
Temperature Resistance Characteristics	±400 PPM/℃ (20Ω max.), ±260 PPM/℃ (20Ω min.)
Withstand Voltage	2000 VAC/min, △R: ±(0.1% + 0.05Ω)
Insulation Resistance	500 VDC, 20MΩ min.
Short-time Overload	When 10 times the rated power is applied for five seconds, △R: ±(2% + 0.05Ω)
Life	1000 hours of repeating the operation ON for 90 minutes and OFF for 30 minutes, △R: ±(5%+0.05Ω)
Heat Resistance	Not ignite after having applied 10 times the rated electric power for one minute
Operating temperature	−25℃ to 150℃

・Model Designation

RH120 (N) 10Ω J

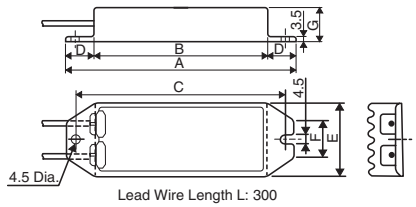
Model
N: Noninductive winding

Resistance

Resistance Tolerance	
Code	Specifications
K	±10%
J	±5%
H	±3%

・External Dimensions

RH120, 150, 220

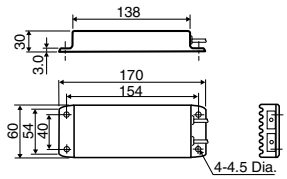


Lead Wire Length L: 300

Model	Rated Power	Resistance
RH120	70 W	1Ω to 100Ω
RH150	90 W	1Ω to 100Ω
RH220	120 W	1Ω to 100Ω

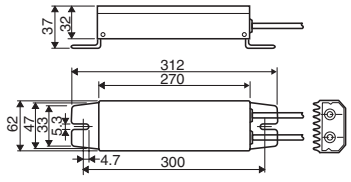
Model	A	B	C	D	E	F	G
RH120	182	150	172	16	42	22	20
RH150	212	180	202	16	44	24	30
RH220	230	200	220	15	60	24	20

RH220B



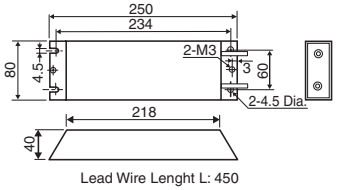
Lead Wire Length L: 500
Rated Power: 120 W
Resistance: 1Ω to 100Ω

RH300C



Lead Wire Length L: 300
Rated Power: 200 W
Resistance: 1Ω to 10kΩ

RH500



Lead Wire Lenght L: 450
Rated Power: 300 W
Resistance: 1Ω to 30Ω

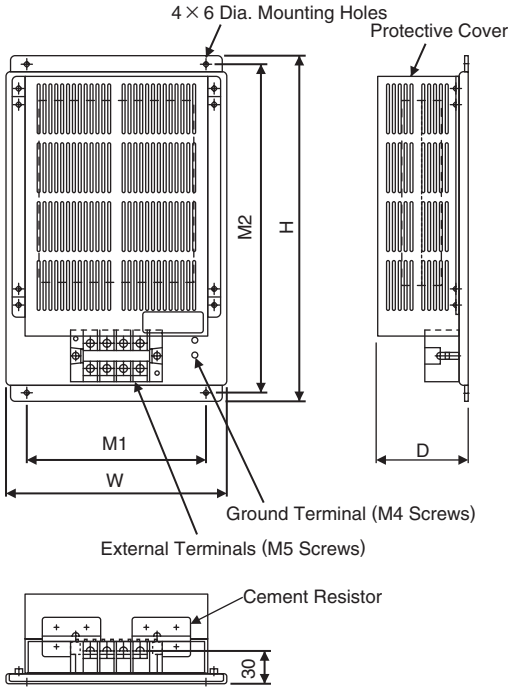
(5) External Regenerative Resistor

② Regenerative Resistor Unit

The SERVOPACKs with a capacity of 6.0 kW or more do not have a built-in regenerative resistor.
The following regenerative resistor unit is required according to the SERVOPACK model.

SERVOPACK Model	Regenerative Resistor Unit Model	Specifications	Allowable Power Loss
SGDS-60A	JUSP-RA04	6.25Ω, 880 W	180 W
SGDS-75A	JUSP-RA05	3.13Ω, 1760 W	350 W

・External Dimensions



Model	W	H	D	M1	M2	Approx. Mass
JUSP-RA04	220	350	92	180	335	4 kg
JUSP-RA05	300	350	95	250	335	7 kg

(6) Brake Power Supply Unit

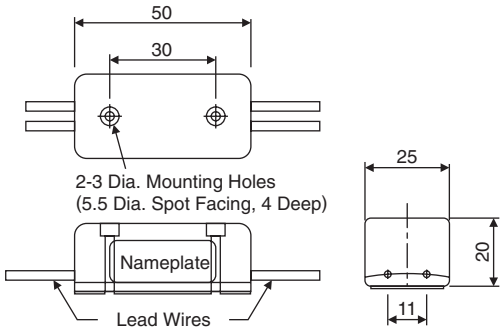
200 V input: LPSE-2H01-E
100 V input: LPDE-1H01-E

・Specifications

Rated output voltage: 90 VDC
Maximum output current: 1.0A DC
Lead wire length: 500 mm
Maximum surrounding air temperature: 60℃
Lead wires: Color coded. Refer to the table below.

To AC Input		To Brake
100 V	200 V	
Blue / White	Yellow / White	Red / Black

・External Dimensions



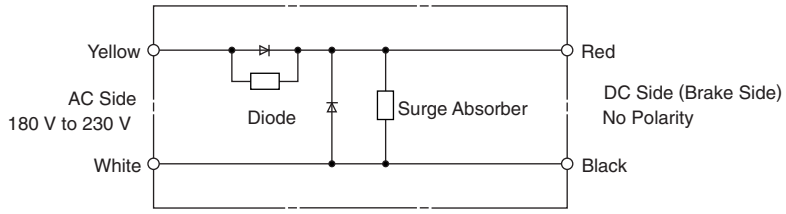
Selecting Peripheral Devices

Units: mm

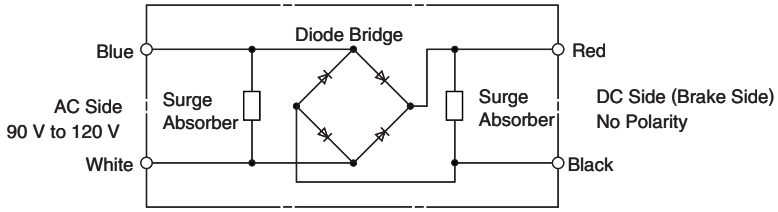
• Internal Circuits

Open or close the circuit for the brake power supply on the AC side of the brake power suppy unit.
When switching on the DC side, install a surge absorber near the brake coil to prevent damage to the brake coil from voltage surges due to DC-side switching.

Internal Circuit for 200 VAC
Brake Power Supply Model: LPSE-2H01-E



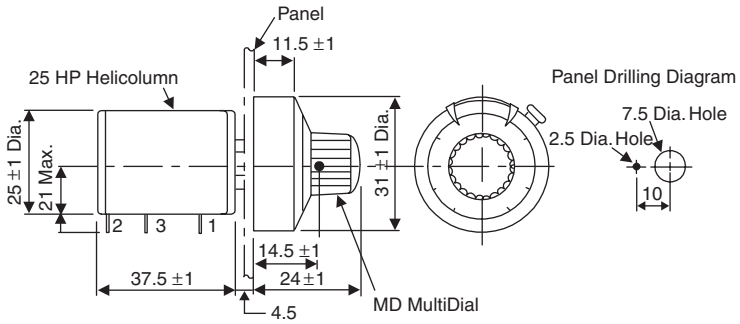
Internal Circuit for 100 VAC
Brake Power Supply Model: LPDE-1H01-E



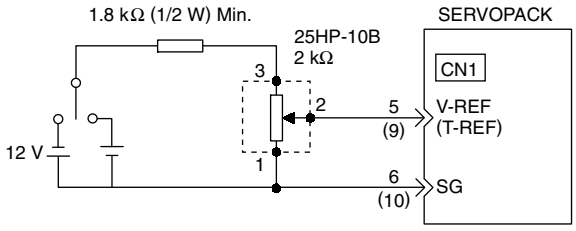
(7) Variable Resistor for Speed and Torque Setting (Model: 25HP-10B)

The multi-turn type winding variable resistors with dial MD10-30B4 are manufactured by Sakae Tsushin Kogyo Co., Ltd.

• External Dimensions

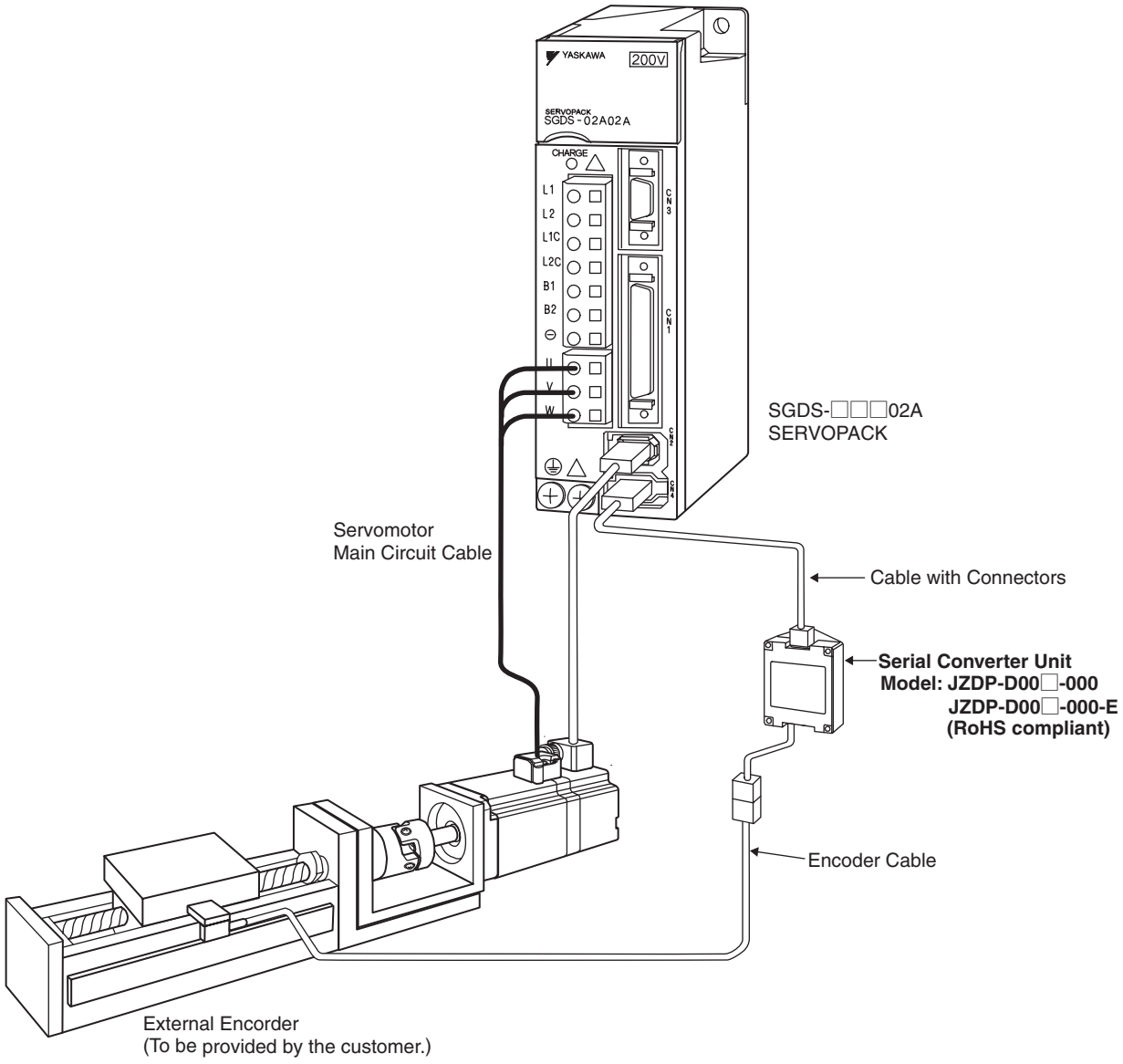


• Connection Example to an External Power Supply



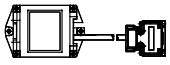
Serial Converter Units for Fully-closed Control

● System Configuration for Fully-closed Control



● Model Designation

JZDP - D00□ - 000 - E

Serial Converter Unit Model			
Symbol	Appearance	Applicable Linear Scale	Hall Sensor
D003		Made by HEIDENHAIN Corporation	None
D005		Made by Renishaw plc.	None

Code	Specifications
None	Not RoHS compliant
E	RoHS compliant

Note: Using the serial converter unit JZDP-A□□□ with SGDS SERVOPACK will void our guarantee.

Serial Converter Units for Fully-closed Control

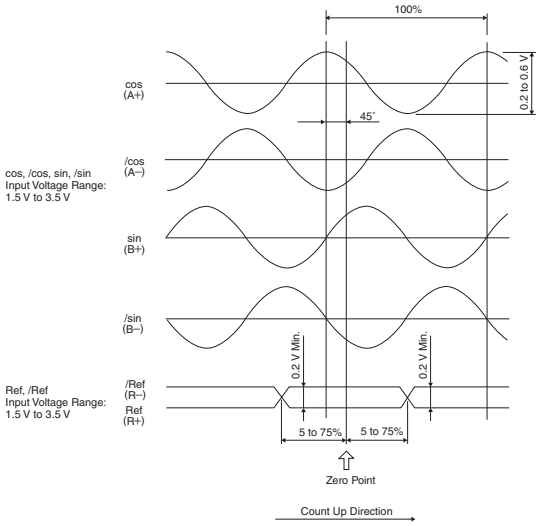
● Characteristics and Specifications

Items		Specifications
Electrical Characteristics	Power Supply Voltage	+5.0 V±5%, ripple content 5% max.
	Current Consumption*1	120 mA typ, 350 mA max.
	Signal Resolution	Input 2-phase sine wave: 1/256 pitch
	Max. Response Frequency	250 kHz
	Analog Input Signals*2 (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V
	Output Signal*3	Position data, alarms
	Output Method	Serial data communications [HDLC (High-level Data Link Control) protocol format with Manchester codes]
	Transmission Cycle	62.5 μs
	Output Circuit	Balanced type transceiver (SN75LBC176 or the equivalent), internal terminating resistor: 120Ω
Mechanical Characteristics	Approx. Mass	150 g
	Vibration Resistance	98 m/s² max. (10 to 2500 Hz) in three directions
	Shock Resistance	980 m/s², (11 ms) two times in three directions
Environmental Conditions	Operating Temperature	0℃ to 55℃
	Storage Temperature	−20℃ to +80℃
	Humidity	20% to 90% RH (no condensation)

*1: The current consumption of the linear scale is not included in this value.
The current consumption of the linear scale must be taken into consideration for the current capacity of host controller that supplies the power.
*2: Input a value within the specified range. Otherwise, incorrect position information is output, and the device may be damaged.
*3: The transmission is enabled 100 to 300 ms after the power turns on.

● Analog Signal Input Timing

The following figure shows the input timing of the analog signals.
When the cos and sin signals are shifted 180 degrees, the differential signals are the /cos and /sin signals.
The specifications of the cos, /cos, and /sin signals are identical except for the phase.
Input the signals Ref and /Ref so that they shall cross each other as shown in the figure because they are input into the converter. When they are crossed, the output data will be counted up.



IMPORTANT

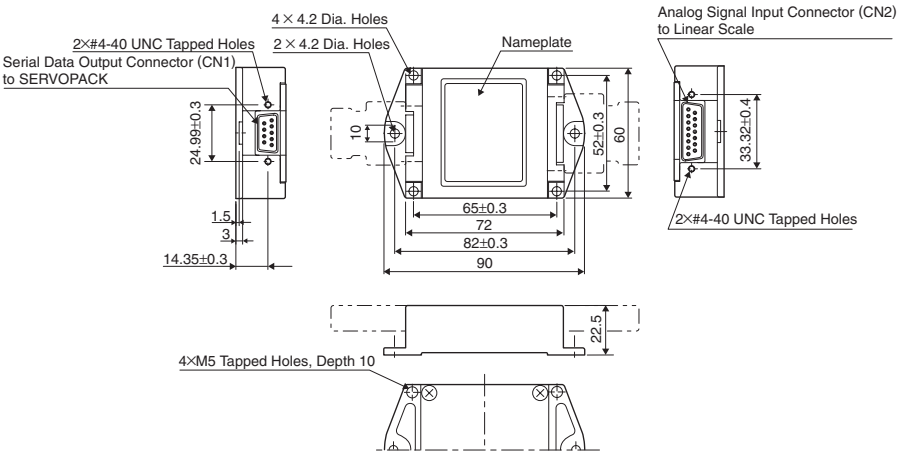
■Precautions

1 Never perform insulation resistance and withstand voltage tests.
2 When analog signals are input to the serial converter unit, noise influence on the analog signals affects the unit's ability to output correct position information. The analog cable must be as short as possible and shielded.
3 Do not connect or disconnect the unit while power is being supplied, or the unit may be damaged.
4 When using multiple axes, use a shield cable for each axis. Do not use a shield cable for multiple axes.

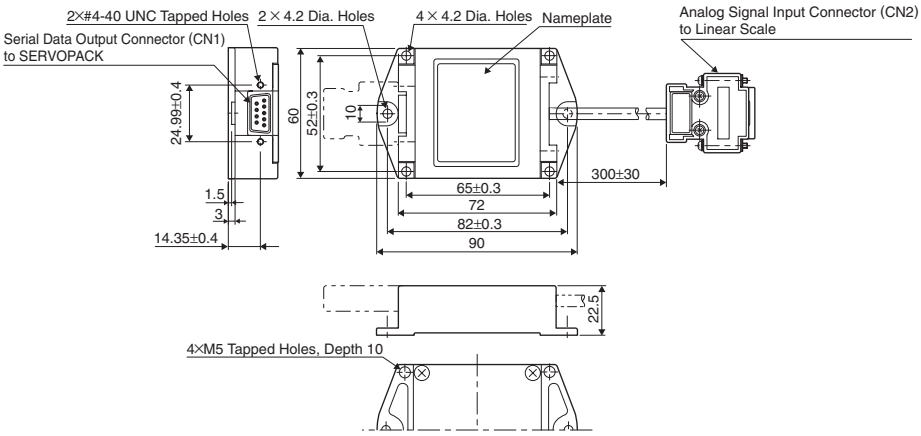
Serial Converter Units for Fully-closed Control Units: mm

● External Dimensions

(1) Model: JZDP-D003-□□□
JZDP-D003-□□□-E(RoHS compliant)



(2) Model: JZDP-D005-□□□
JZDP-D005-□□□-E(RoHS compliant)

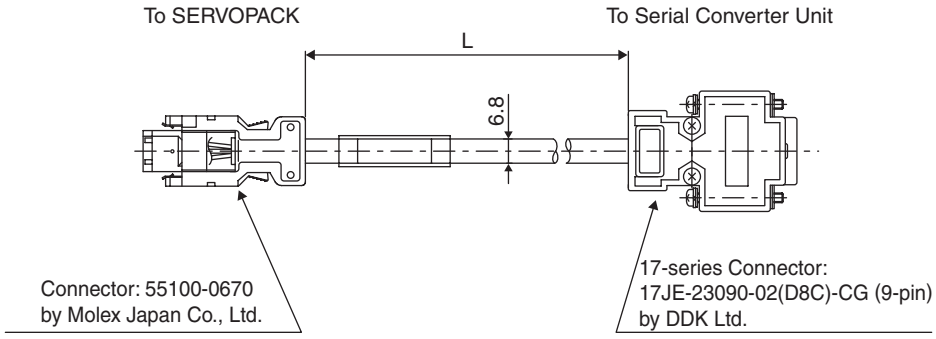


● Connection Cable between SERVOPACK and Serial Converter Unit

・Recommended Cables

Name	Application	Model No.	Length
Cable with connectors	Connection between SERVOPACK connector (CN4) and serial converter unit	JZSP-CLP20-03-E	3 m
		JZSP-CLP20-05-E	5 m
		JZSP-CLP20-10-E	10 m
		JZSP-CLP20-15-E	15 m
		JZSP-CLP20-20-E	20 m

・Dimensional Drawing

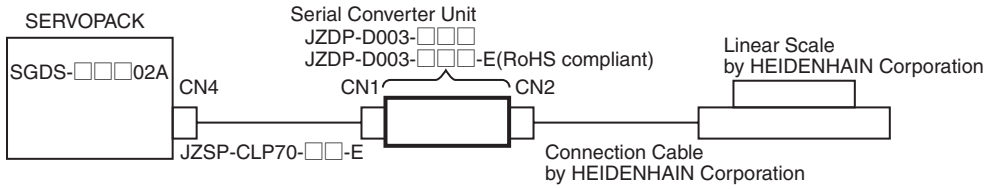


Serial Converter Units for Fully-closed Control

● Connection Examples

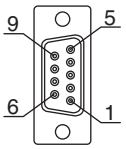
(1) Connection Example with Linear Scale by HEIDENHAIN Corporation

・Model: JZDP-D003-□□□
JZDP-D003-□□□-E(RoHS compliant)



Pin No.	Signal
1	+5 V
2	S-phase output
3	Not used
4	Not used
5	0 V
6	/S-phase output
7	Not used
8	Not used
9	Not used
Case	Shield

CN1
Serial Data Output
to SERVOPACK

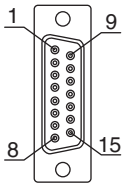


17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0 V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
case	Shield

CN2
Analog Signal Input
to Linear Scale



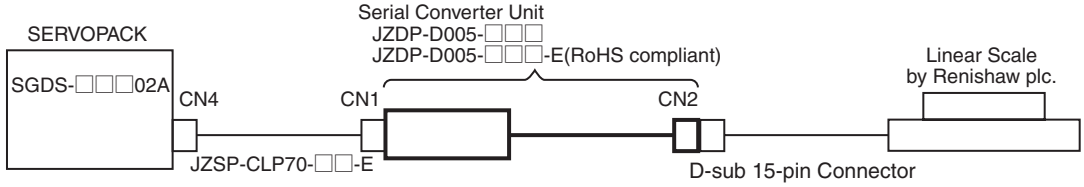
17-series Connector:
17LE-13150-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13150-27-FA
(Socket)

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin) manufactured by Heidenhain Corporation can be directly connected.

(2) Connection Example with Linear Scale by Renishaw plc.

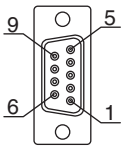
・Model: JZDP-D005-□□□
JZDP-D005-□□□-E(RoHS compliant)



Pin No.	Signal
1	+5 V
2	S-phase output
3	Not used
4	Not used
5	0 V
6	/S-phase output
7	Not used
8	Not used
9	Not used
Case	Shield

SERVOPACK does not have the function to process Vq signals.

CN1
Serial Data Output
to SERVOPACK

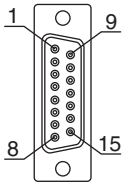


17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner (0 V)
Case	Shield

CN2
Analog Signal Input
to Linear Scale



17-Series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK Ltd.

・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin) by Renishaw plc. can be directly connected. However, the BID and DIR signals are not connected.
3 Use the linear-scale connector to change the home position specifications of the linear scale.

SERVOPACKs

For Rotary Servomotors

SGDS-□□□12

(MECHATROLINK-Ⅱ Communications and Fully-closed Control)

The SGDS-□□□12 SERVOPACK is compatible with the MECHATROLINK-Ⅱ high-speed motion field network.
The MECHATROLINK-Ⅱ cable enables real-time communications for high-accuracy motion control at low cost.

Features

● Real-time communications

MECHATROLINK-Ⅱ communications enable high-speed control for 30 stations at a maximum transmission speed of 10 Mbps in a transmission cycle from 250 μs s to 4 ms (user setting). Such a high transmission speed allows real-time transmission of various data required for control.

● Cost savings

Thirty stations can be connected to a single MECHATROLINK-Ⅱ transmission line, so wiring costs and time are greatly reduced. Also, only one signal connector is required on the host controller. And, the all-digital network eliminates the need for conversion from digital to analog and for a pulse generator to generate position references.

● High-precision motion control

The SGDS-□□□12 SERVOPACK when connected to the host controller in the MECHATROLINK-Ⅱ network provides not only torque, position, and speed control but also synchronized phase control that requires advanced control technology. The control mode can be changed online so that the machine can move smoothly in complex motions with great efficiency.

Model Designation

SGDS - A5 A 12 A □

Σ-Ⅲ Series
SGDS SERVOPACK

Max. Rated Output of Applicable Servomotor

Code	Specifications
A3	30 W
A5	50 W
01	100 W
02	200 W
04	400 W
05	500 W
08	750 W
10	1.0 kW
15	1.5 kW
20	2.0 kW
30	3.0 kW
50	5.0 kW
60	6.0 kW
75	7.5 kW

Power Supply Voltage

Code	Specifications
A	200 VAC
F	100 VAC (100-V input, 200-V output: Doubled voltage)
B	100 VAC (100-V input, 100-V output: For SGMMJ servomotors)

Interface Specifications
12 : For MECHATROLINK-Ⅱ communications and fully-closed control (For rotary servomotors)

Design Revision Order
A, B, · · ·

Mounting Method
Blank : Base-mounted (7.5 kW or less)
R : Rack-mounted (5.0 kW or less)

Ratings and Specifications

SERVOPACK Model SGDS-				A3B	A5	01	02	04	05	08	10	15	20	30	50	60	75
Basic Specifications	Max. Applicable Servomotor Capacity kW			0.03	0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	6.0	7.5
	100 V	Continuous Output Current Arms		0.98	0.66	0.91	2.1	2.8	—								
		Max. Output Current Arms		2.9	2.1	2.8	6.5	8.5	—								
	200 V	Continuous Output Current Arms		—	0.66	0.91	2.1	2.8	3.8	5.5	7.6	11.6	18.5	18.9	32.9	46.9	54.7
		Max. Output Current Arms		—	2.1	2.8	6.5	8.5	11.0	16.9	17.0	28.0	42.0	56.0	84.0	110.0	130.0
	Input Power Supply	SERVOPACK Capacity Range for 100/200 V		Single-phase 100 VAC					—								
				—	Single-phase 200 VAC				—	Single-phase 200 VAC	—						
				—					Three-phase 200 VAC	—	Three-phase 200 VAC						
		200 V	Main Circuit	Three-phase (or 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													
		100 V	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													
	Control Method			Single or three-phase full-wave rectification IGBT-PWM (sine-wave driven) [Single-phase full-wave rectification for SGDS-A3B (100 V)]													
	Feedback			Encoder: 13-bit (incremental) Encoder: 17-bit (incremental/absolute) Encoder: 20-bit (incremental/absolute)													
	Operating Conditions	Surrounding Air/Storage Temperature		0°C to +55°C/−20°C to +85°C													
		Ambient/Storage Humidity		90% RH or less (with no condensation)													
		Vibration/Shock Resistance		4.9 m/s² / 19.6 m/s²													
	Configuration			Base-mounted (Rack mounting available as an option for SGDS-A3 to -50)													
	Performance	Speed Control Range		1:5000 (The lowest speed of the speed control range is the speed at which the servomotor will not stop with a rated torque load.)													
		Speed Regulation*	Load Regulation	0 to 100% load: ±0.01% max. (at rated speed)													
			Voltage Regulation	Rated voltage ±10%: 0% (at rated speed)													
			Temperature Regulation	25±25°C: ±0.1% max. (at rated speed)													
		Frequency Characteristics		600 Hz (at $J_L=J_M$)													
		Torque Control Tolerance (Repeatability)		±1%													
		Soft Start Time Setting		0 to 10 s (Can be set individually for acceleration and deceleration.)													
Built-in Functions	Dynamic Brake (DB)			Operated at main power OFF, servo alarm, servo OFF or overtravel													
	Regenerative Processing			External regenerative resistor (optional)					Built-in							External regenerative resistor (necessary)	
	Overtravel Prevention (OT)			Dynamic brake stop at P-OT or N-OT: the motor decelerates to a stop or coasts to a stop.													
	Electronic Gear			0.001≦B/A≧1000													
	Protection			Overcurrent, overvoltage, low voltage, overload, regeneration error, main circuit sensor error, heat sink overheat, power phase loss, position error pulse overflow, overspeed, encoder error, overrun detection, CPU error, parameter error, and so on.													
	LED Display			CHARGE, POWER, COM, one 7-segment LED (built-in Digital Operator functions)													
	Others			Reverse connection, zero position search, automatic motor discrimination function													

*: 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 voltge variations or amplifier drift and changes in processing resistance due to temperature variation.
The ratio of speed changes to the rated speed represent speed regulation due to voltage and temperature variations.

Ratings and Specifications

Applicable SERVOPACK Model			SGDS-□□□12□ All Capacities	
MECHATROLINK Communications		Communications Protocol	MECHATROLINK-Ⅱ	MECHATROLINK-Ⅰ
		Station Address	41H to 5FH (Max. number of slaves: 30)	41H to 4FH (Max. number of slaves: 15)
		Transmission Speed	10 Mbps	4 Mbps
		Transmission Cycle	250 μs, 0.5 ms to 4 ms (multiple of 0.5 ms) (In accordance with the setting of the host controller)	2 ms
		Number of Words for Link Transmission	Can be switched between 17-byte/ station and 32-byte/station by the setting of bit 2 for the SW2 switch.	17-byte/station
Command Method		Performance	Position control, speed control, and torque control through MECHATROLINK-Ⅱ communications	Position control through MECHATRIOLINK-Ⅰ communications
		Command Input	MECHATROLINK-Ⅰ commands and MECHATROLINK-Ⅱ commands (For sequence, motion, date setting/reference, monitor, adjustment, and other commands.)	
Functions for Position Control		Acceleration/ Deceleration Function	Linear 1st and 2nd step asymmetrical acceleration/deceleration, exponential function position reference filter, and movement average position reference filter	
		Fully-closed Control	Position control using the fully-closed feedback is available.	
Fully-closed Control System Specifications		Interface	Serial communications interface	
		Power Supply and Converter for Fully-closed PG	Provided by the customer.	
I/O Signals	Sequenoce Input	Signal allocation can be modified.	Select any seven of the following signals: forward run prohibited (P-OT), reverse run prohibited (N-OT), homing deceleration limit switch, external latch signal 1, 2, 3, forward external torque limit, or reverse external torque limit	
	Sequence Output	Fixed Output	Alarm	
		Signal allocation can be modified.	Select any three of the following signals: positioning completion (speed coincidence), rotation detection, speed limit detection, servo ready, torque limit, release brake, warning, or NEAR singal	
	Position Output	Form	Phase-A, -B, -C: line driver output	
		Frequency Dividing Ratio	Any Setting Ratio	
Others	Analong Monitor (CN5)		Output voltage: ±8 VDC Analog monitor connector built in for monitoring speed, torque and other reference signals. Speed: 1 V/1000 min^{-1} Torque: 1 V/rated torque Position error pulse: 0.05 V/reference unit	
	Communications	Interface	Digital Operator (hand type)	
		Function	Status display, parameter setting, monitor display, alarm traceback display, and JOG operation	

● 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 Capacity kW	SERVOPACK Model SGDS-	Power Supply Capacity kVA	Output Current (Effective Value) A	Main Circuit Power Loss W	Regenerative Resistor Power Loss*1 W	Control Circuit Power Loss W	Total Power Loss W
Single-phase 100 V	0.03	A3B	0.25	1.98	5.2	*2	13	19.2
	0.05	A5F	0.25	0.66	5.2			18.2
	0.10	01F	0.40	0.91	12			25
	0.20	02F	0.60	2.1	16.4			29.4
	0.40	04F	1.2	2.8	24			37
Single-phase 200 V	0.05	A5A	0.25	0.66	4.6			17.6
	0.10	01A	0.40	0.91	6.7			19.7
	0.20	02A	0.75	2.1	13.3			26.3
	0.40	04A	1.2	2.8	20			33
	0.75	08A	2.2	5.5	47	12	15	74
Three-phase 200 V	0.5	05A	1.4	3.8	27	8		54
	1.0	10A	2.3	7.6	55	12		82
	1.5	15A	3.2	11.6	92	10		117
	2.0	20A	4.3	18.5	120	16		151
	3.0	30A	5.9	18.9	155	16		186
	5.0	50A	7.5	32.8	255	36	19	310
	6.0	60A	12.5	46.9	360	*3		379
	7.5	75A	15.5	54.7	455			474

*1: Regenerative resistor power losses are allowable losses. Take the following action if this value is exceeded.
- Remove the lead from the internal regenerative resistor in the SERVOPACK.
- Install an external regenerative resistor.

An external regenerative resistor is available as an option.

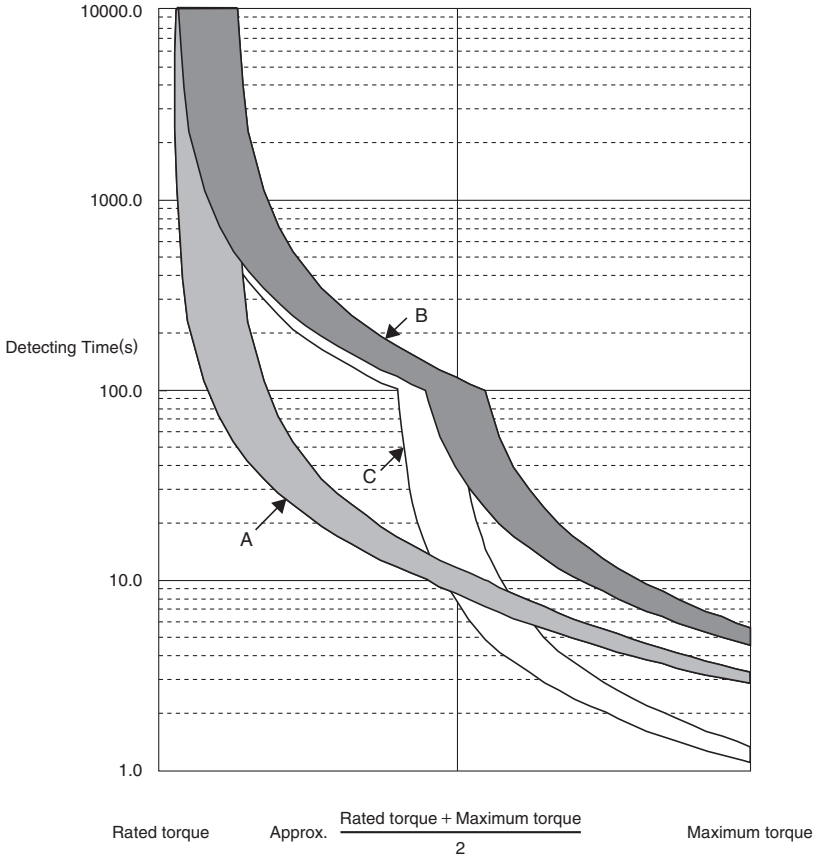
*2: SERVOPACKs with a capacity of 50 W to 400 W do not have built-in regenerative resistors. If the regenerative energy exceeds the specified value, connect an external regenerative resistor.

*3: Install an external regenerative resistor when using the SERVOPACK with capacity of 6.0 kW or more.
The following regenerative resistor can be used:
- JUSP-RA04: For SGDS-60A (Allowable power loss 180 W)
- JUSP-RA05: For SGDS-75A (Allowable power loss 350 W)

Ratings and Specifications

● Overload Characteristics

The overload detection level is set under hot start conditions at a servomotor surrounding air temperature of 40℃.

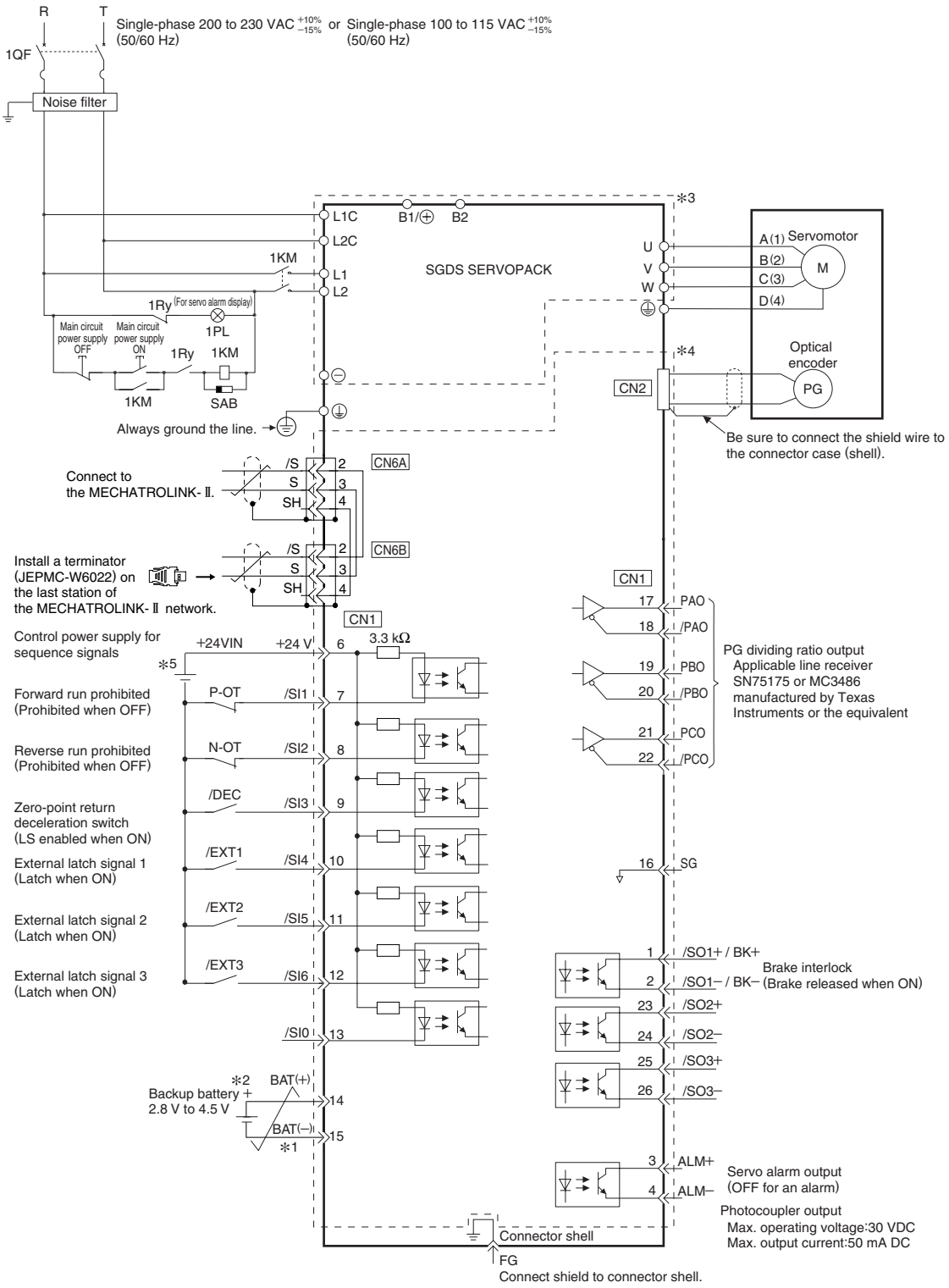


Note: The overload characteristics of A, B, and C in the figure are applicable when the SERVOPACK is combined with one of the following servomotors.

Graph Type	Servomotor Model					
	SGMMJ-	SGMAS-	SGMPS-	SGMSS-	SGMGH-	SGMCS-
A	A1 to A3	A5 to 04	01 to 04	–	–	02 to 35
B	–	06 to 12	08 to 15	10 to 30	03 to 30	45 to 2Z
C	–	–	–	40 to 70	40 to 75	–

Connection Examples

● Single-phase 100 VAC or 200 VAC Power Supply

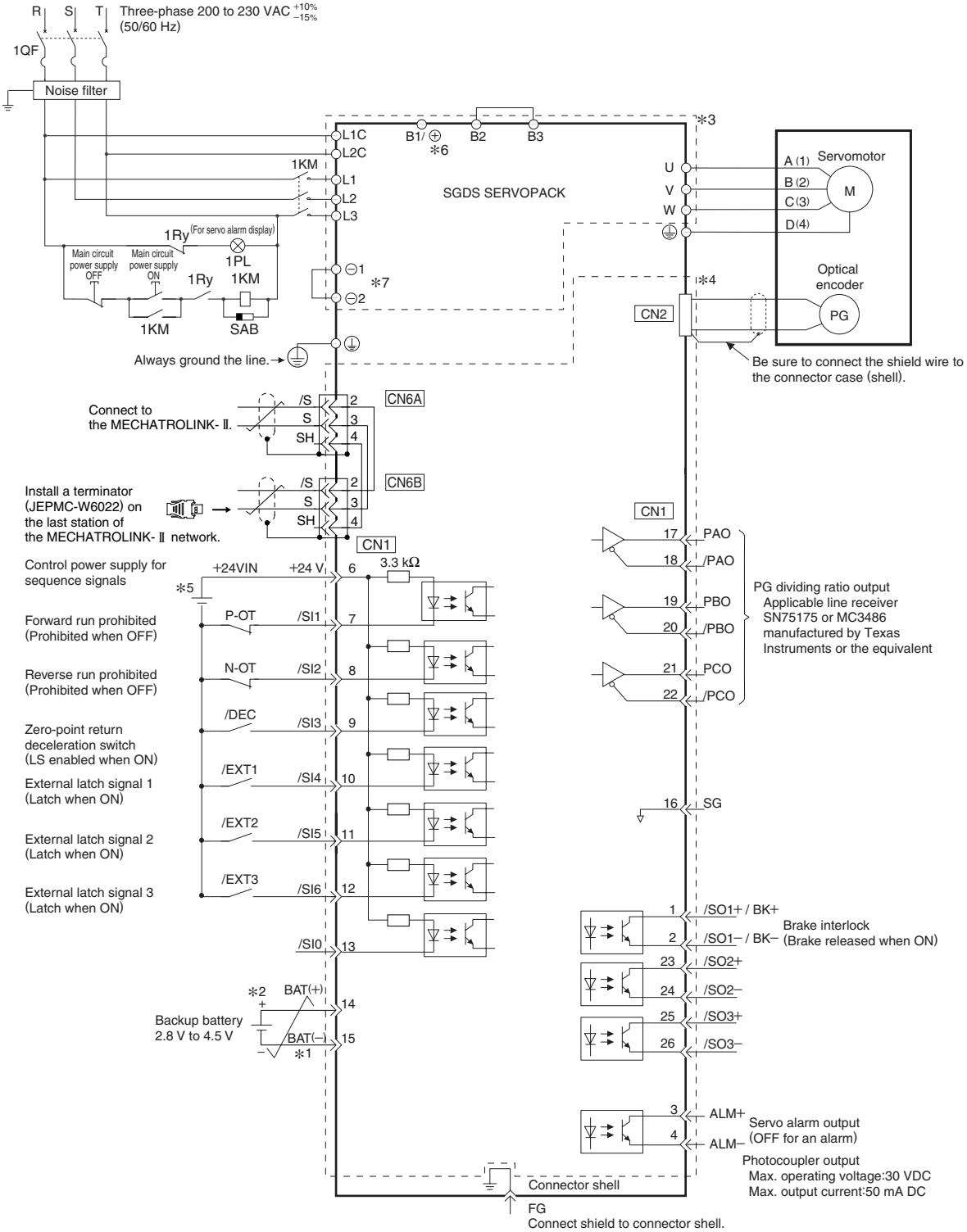


∗1 : represents twisted-pair wires.
∗2 : Connect these terminals to a back-up battery using an external power supply if using an absolute encoder. When an encoder cable with a battery case is used, do not connect a back-up battery.
∗3 : This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.
∗4 : SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.
∗5 : Customers must purchase a 24-VDC power supply with double-shielded enclosure.

Note: The functions allocated to the output signals /SO2 and /SO3 can be changed by using the parameters.

Connection Examples

● Three-phase 200 VAC Power Supply



∗1 : ⫽ represents twisted-pair wires.
∗2 : Connect these terminals to a back-up battery using an external power supply if using an absolute encoder. When an encoder cable with a battery case is used, do not connect a backup battery.
∗3 : This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.
∗4 : SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.
∗5 : Customers must purchase a 24-VDC power supply with double-shielded enclosure.
∗6 : When an external regenerative resistor is needed, disconnect the wiring between the SERVOPACK's B2 and B3 terminals and connect an external regenerative resistor between the B1/⊕ and B2 terminals or between the B1 and B2 terminals
∗7 : Connect a DC reactor for power supply harmonic suppression between the SERVOPACK's ⊖1 and ⊖2 terminals.
Note: The functions allocated to the output signals /SO2 and /SO3 can be changed by using the parameters.

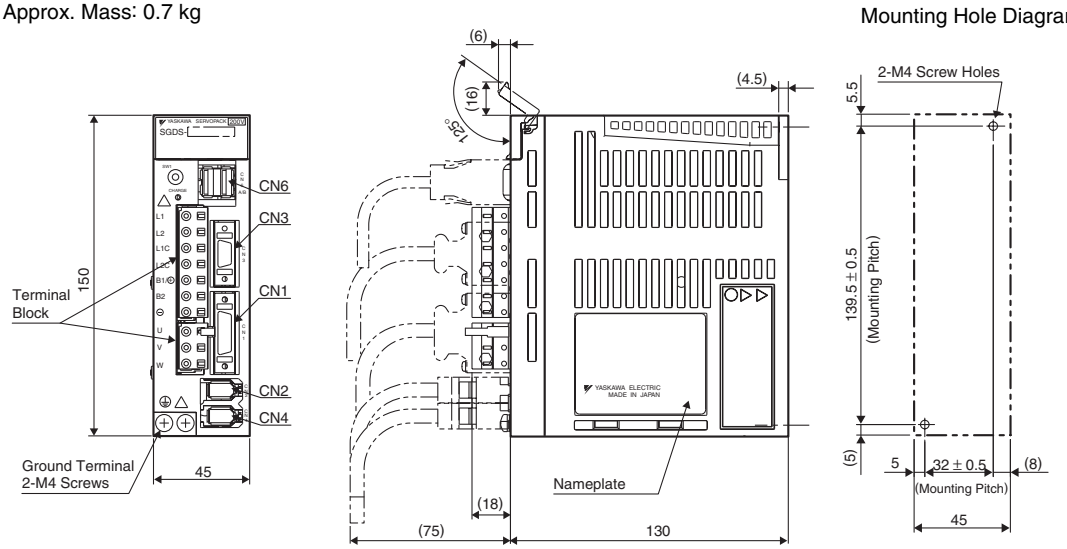
External Dimensions Units: mm

● Base-mounted SERVOPACKs

(1) Single-phase 100 V: 30 W
Single-phase 100/200 V: 50 W to 200 W

Approx. Mass: 0.7 kg

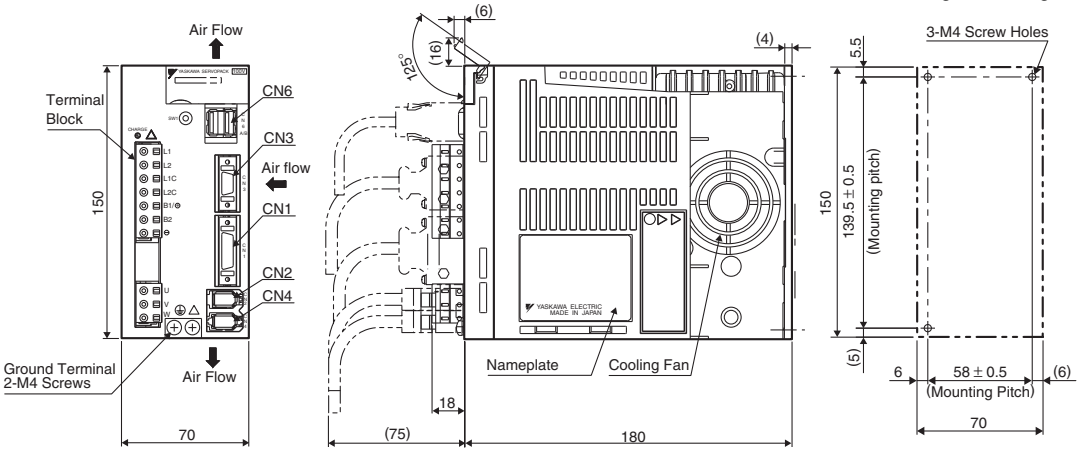
Mounting Hole Diagram



(2) Single-phase 100 V: 400 W

Approx. Mass: 1.4 kg

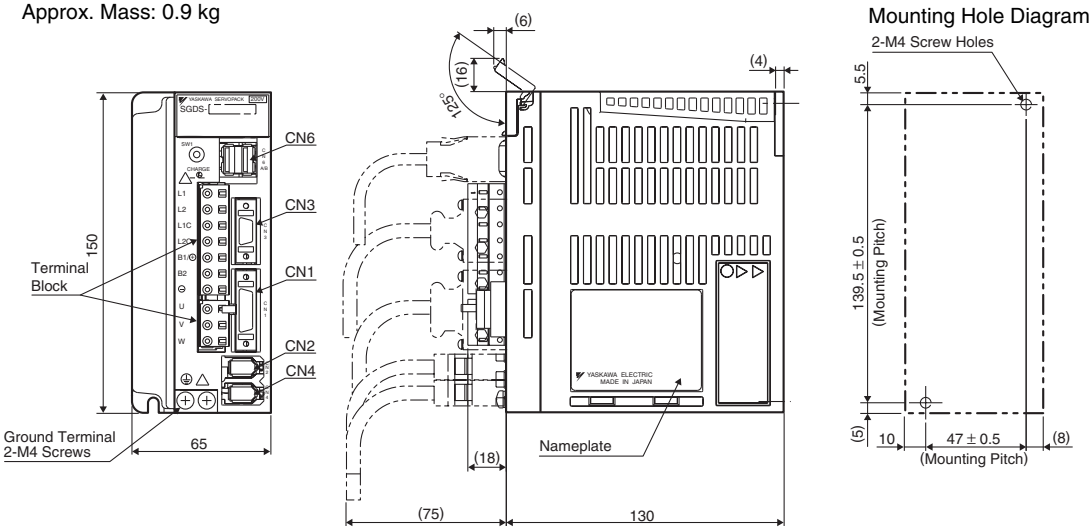
Mounting Hole Diagram



(3) Single-phase 200 V: 400 W

Approx. Mass: 0.9 kg

Mounting Hole Diagram



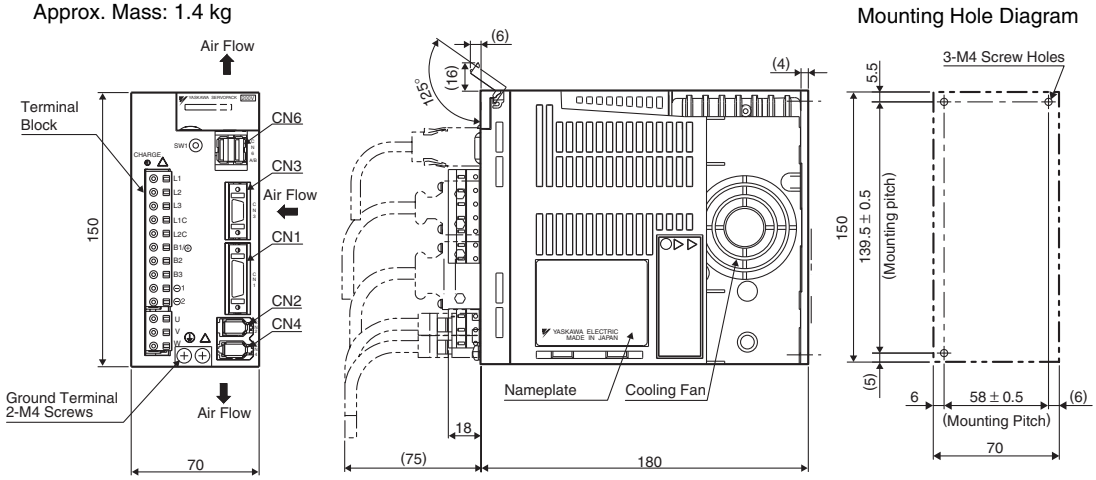
External Dimensions Units: mm

(4) Single-phase 200 V: 750 W
Three-phase 200 V: 500 W, 1.0 kW

Note: Do not use the L3 terminal of the single-phase 200 V, 750 W SERVOPACK.

Approx. Mass: 1.4 kg

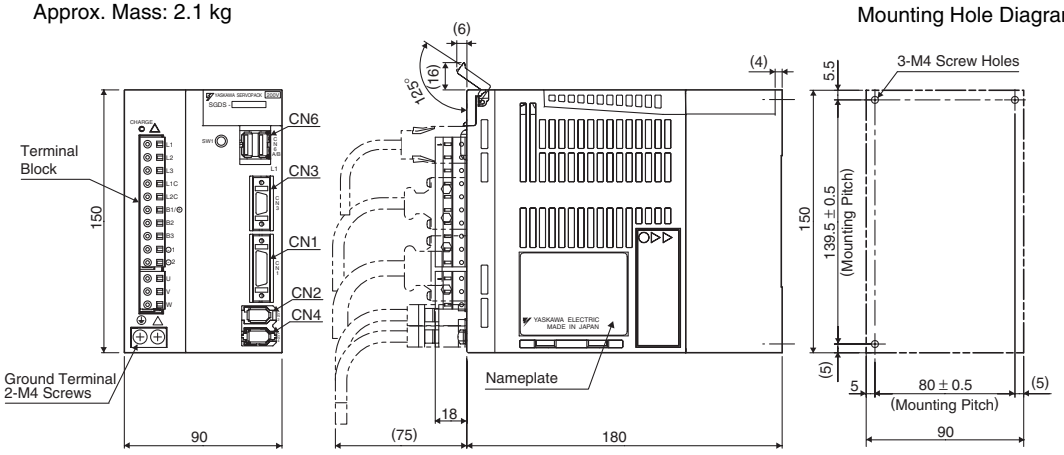
Mounting Hole Diagram



(5) Three-phase 200 V: 1.5 kW

Approx. Mass: 2.1 kg

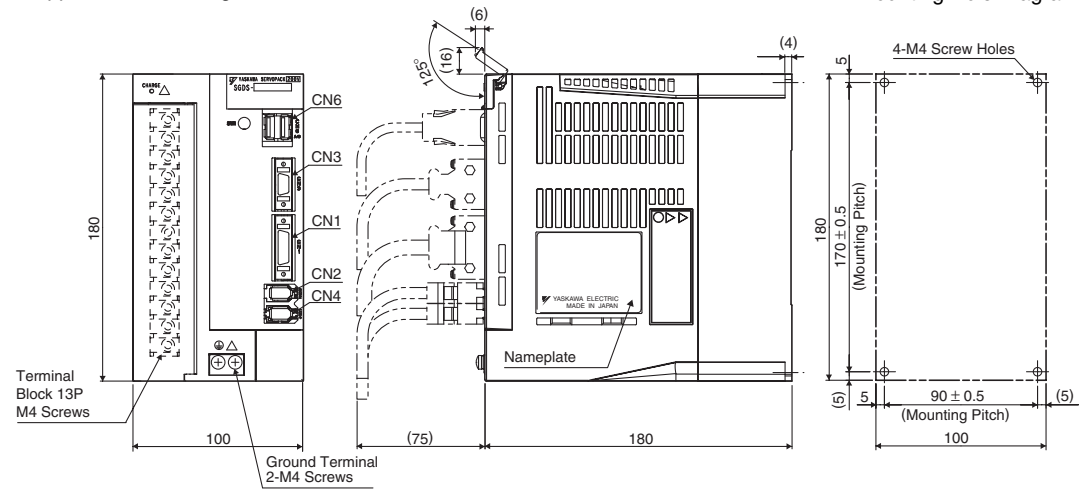
Mounting Hole Diagram



(6) Three-phase 200 V: 2.0 kW, 3.0 kW

Approx. Mass: 2.8 kg

Mounting Hole Diagram

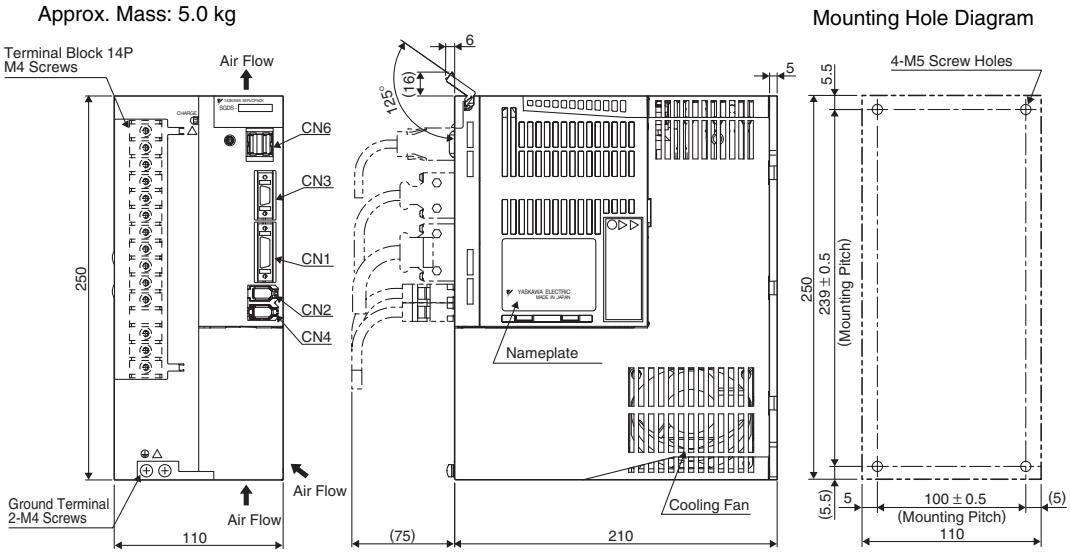


External Dimensions Units: mm

● Base-mounted SERVOPACKs

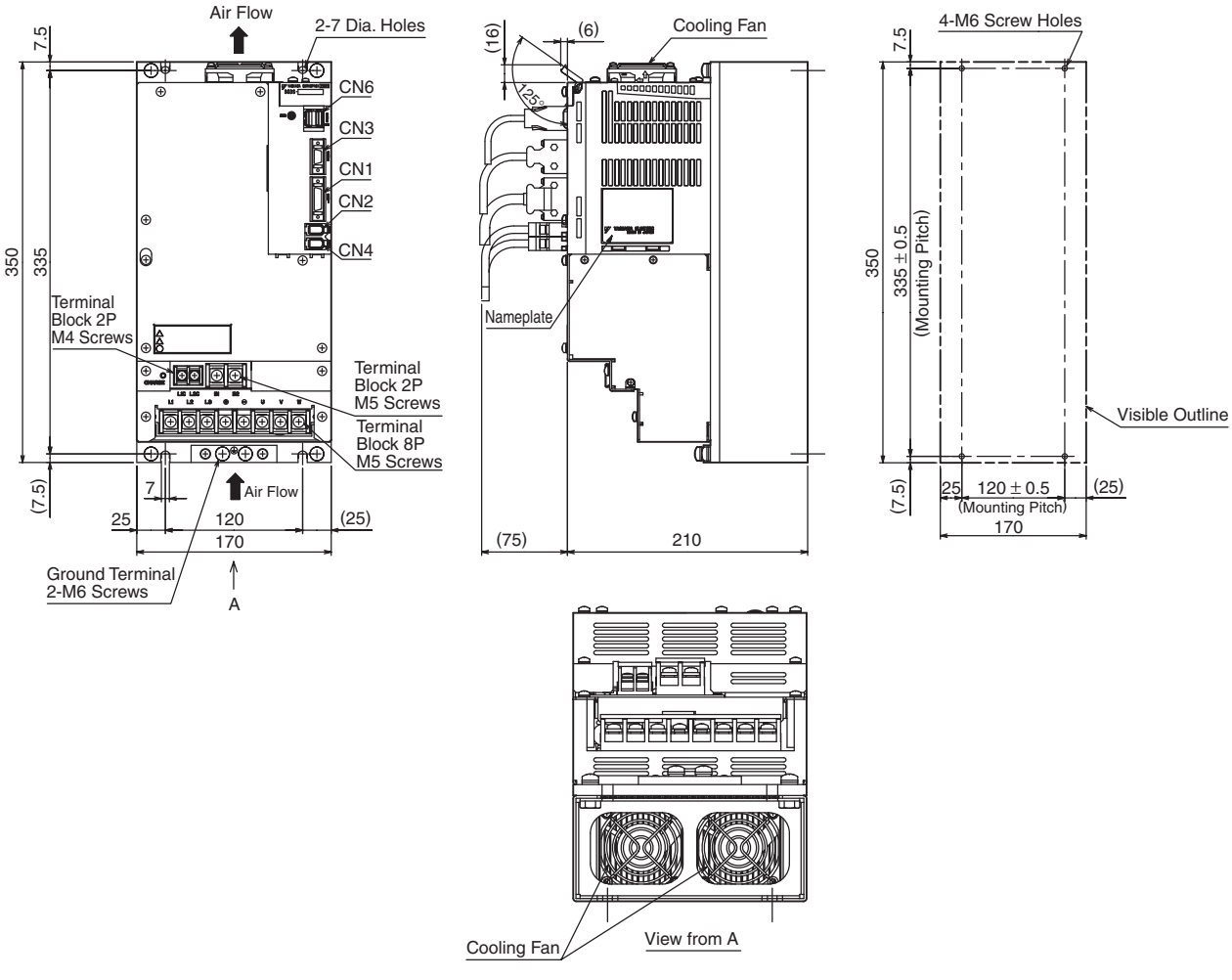
(7) Three-phase 200 V: 5.0 kW

Approx. Mass: 5.0 kg



(8) Three-phase 200 V: 6.0 kW, 7.5 kW

Approx. Mass: 10.5 kg

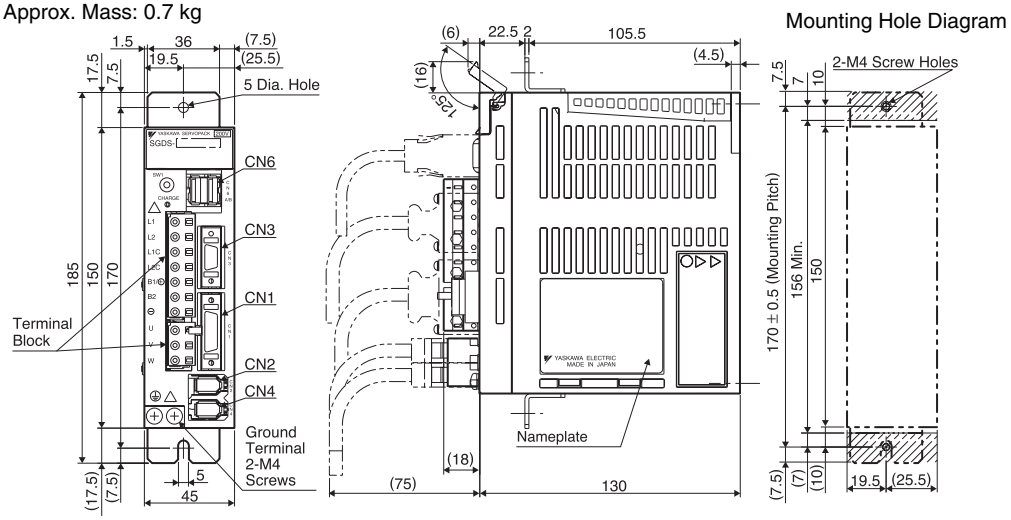


External Dimensions Units: mm

- Rack-mounted SERVOPACKs

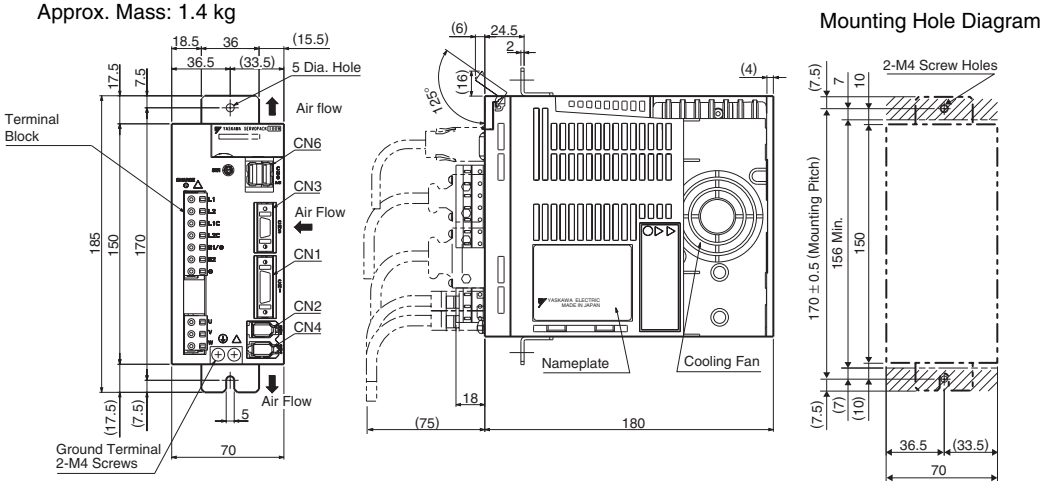
(1) Single-phase 100/200 V: 50 W to 200 W

Approx. Mass: 0.7 kg



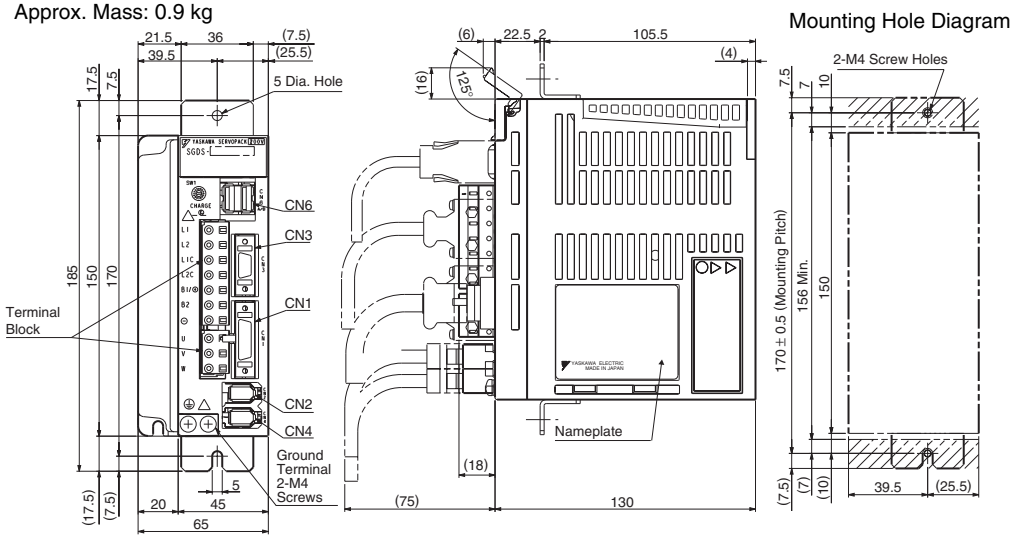
(2) Single-phase 100 V: 400 W

Approx. Mass: 1.4 kg



(3) Single-phase 200 V: 400 W

Approx. Mass: 0.9 kg



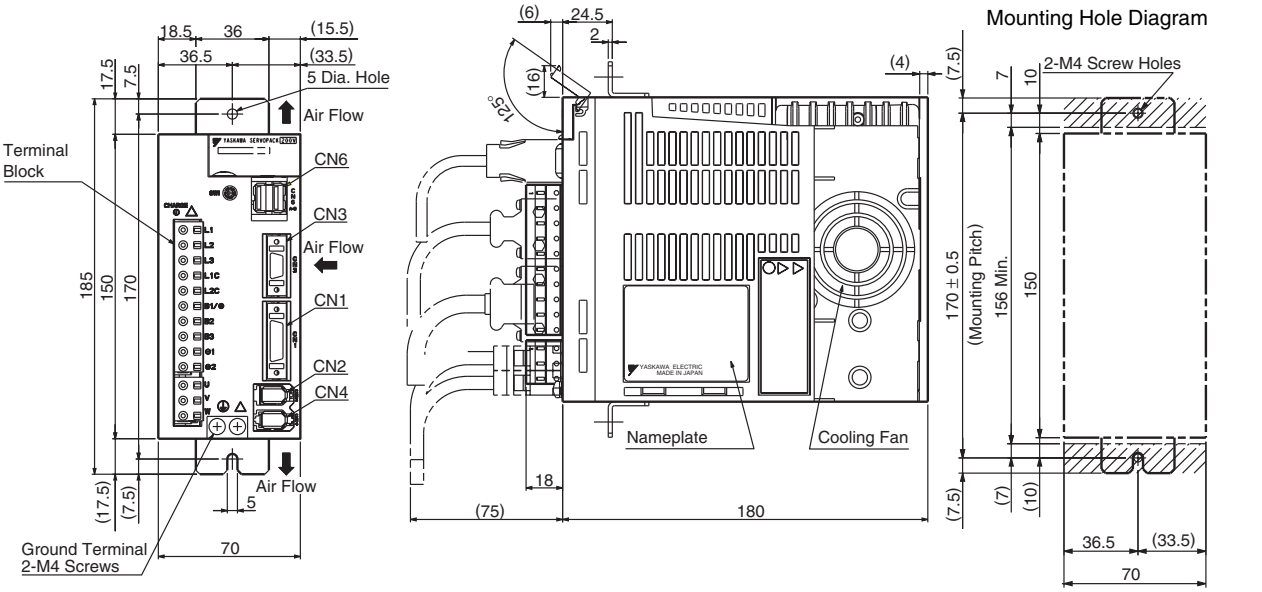
External Dimensions Units: mm

● Rack-mounted SERVOPACKs

(4) Single-phase 200 V: 750 W
Three-phase 200 V: 500 W, 1.0 kW

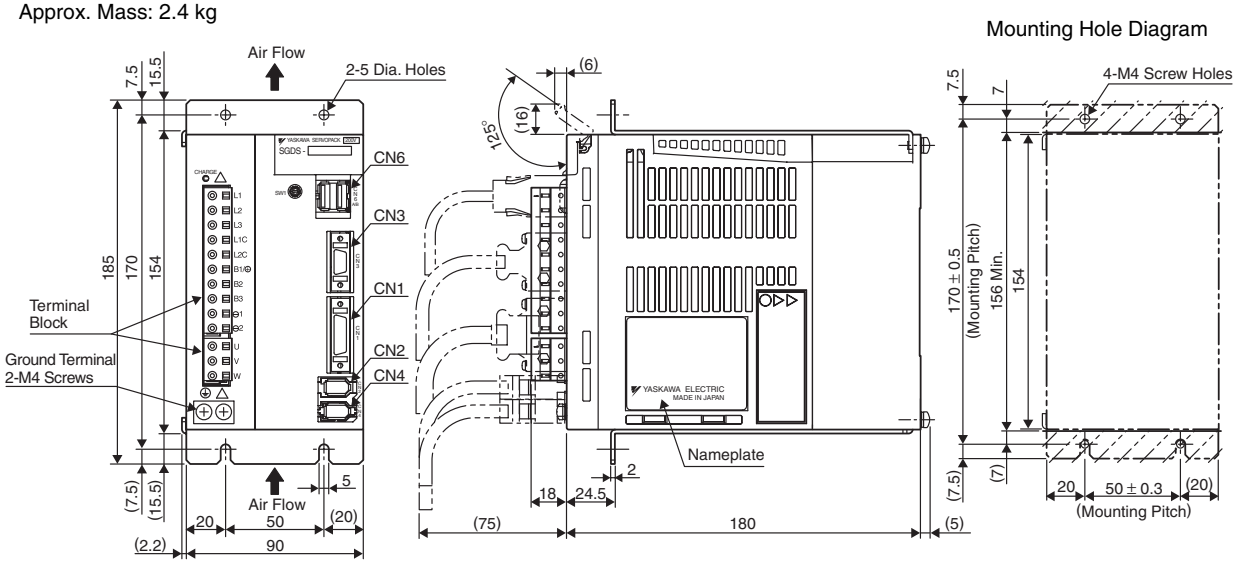
Note: Do not use the L3 terminal of the single-phase 200 V, 750 W SERVOPACK.

Approx. Mass: 1.4 kg



(5) Three-phase 200 V: 1.5 kW

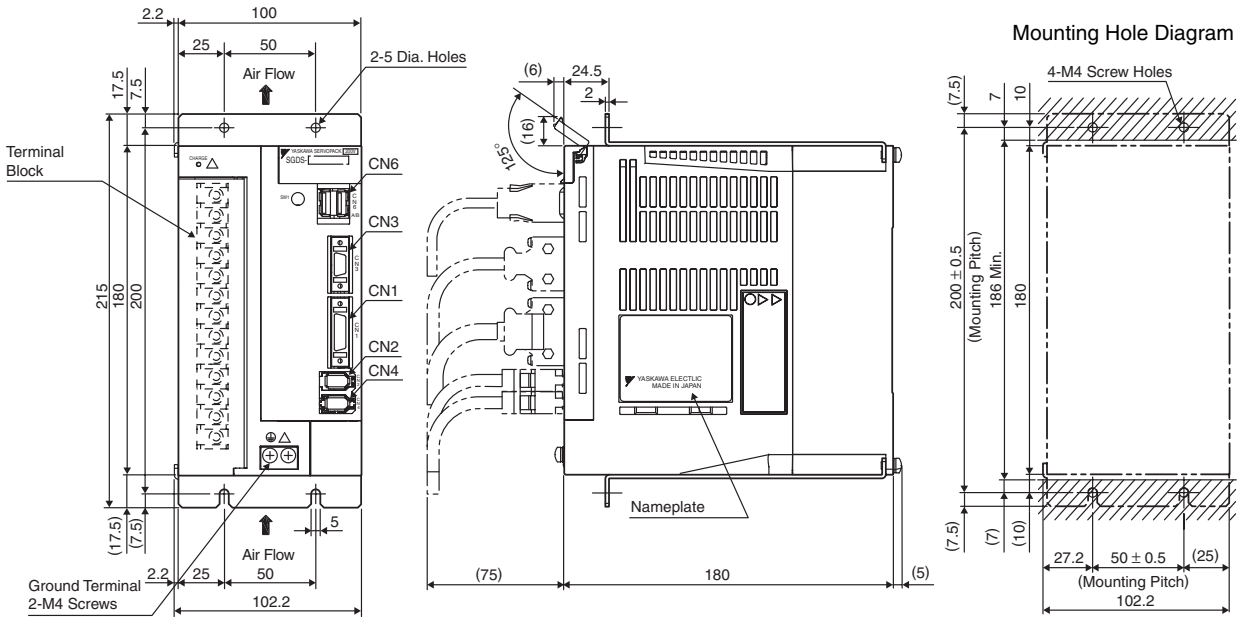
Approx. Mass: 2.4 kg



External Dimensions Units: mm

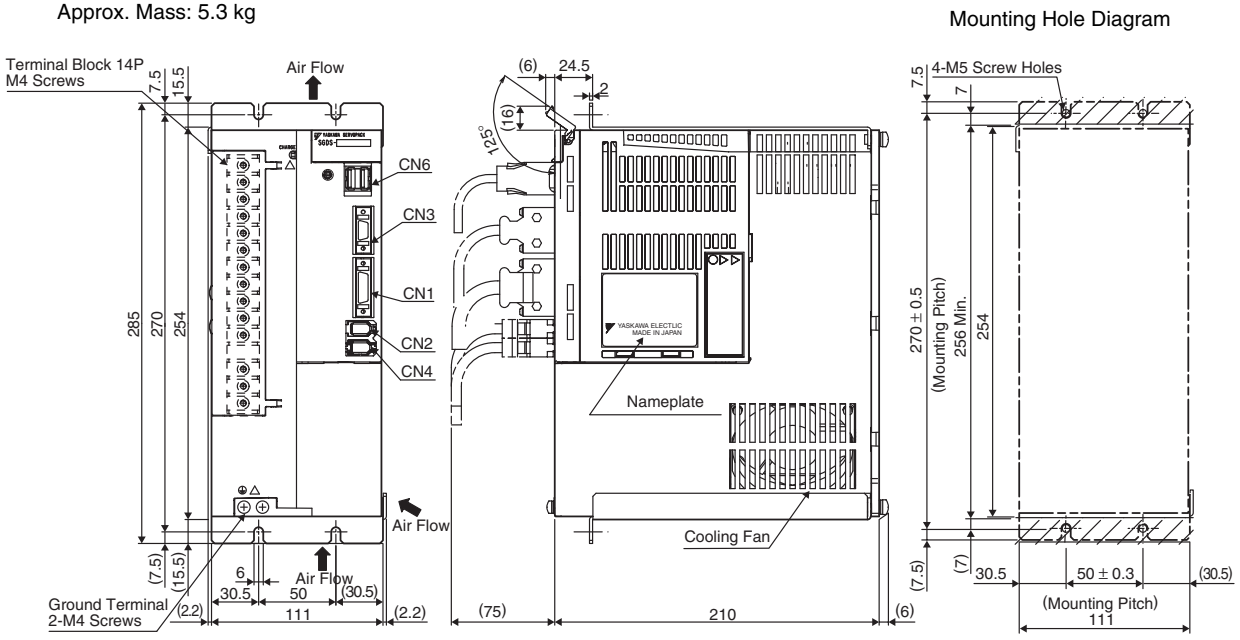
(6) Three-phase 200 V: 2.0 kW, 3.0 kW

Approx. Mass: 3.1 kg



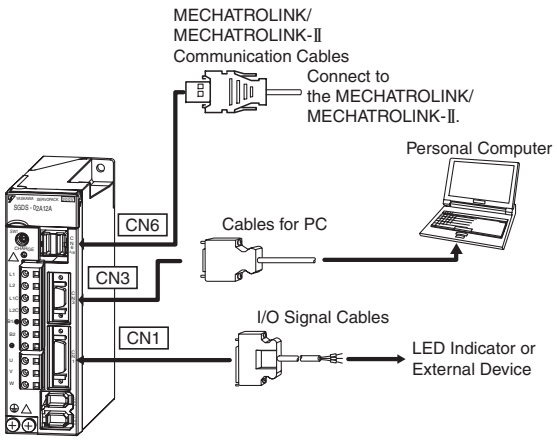
(7) Three-phase 200 V: 5.0 kW

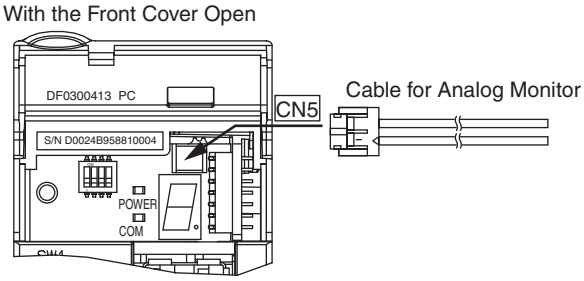
Approx. Mass: 5.3 kg

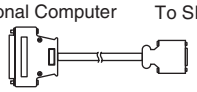
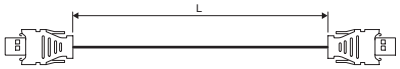
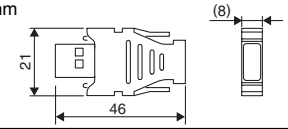


Selecting Cables

● Cable Connections to CN1 , CN3 , CN5 , and CN6





Name		Length	Order No.	Specifications	Details
To CN1 I/O Signal Cables	Connector Kit		JZSP-CSI9-2-E (DE9411354)	Soldered	(1)
	Connector		Connector: 10126-3000PE Case: 10326-52A0-008 (Sumitomo 3M Ltd.)		
	Connector Terminal Block Converter Unit		JUSP-TA26P-E	Terminal Block Converter Unit and 0.5 m Connection Cable 	(2)
To CN3 Cables for PC		2 m	JZSP-CMS01-E	D-Sub 25-pin (for PC98) To Personal Computer To SERVOPACK 	See page 203.
		2 m	JZSP-CMS02-E	D-Sub 9-pin (for DOS/V) To Personal Computer To SERVOPACK 	
		2 m	JZSP-CMS03-E	Half-pitch 14-pin (for PC98) To Personal Computer To SERVOPACK 	
To CN6A and CN6B MECHATROLINK/ MECHATROLINK-Ⅱ Communication Cable	Cable with Connectors at Both Ends	0.5 m	JEPMC-W6002-A5-E		–
		1 m	JEPMC-W6002-01-E		
		3 m	JEPMC-W6002-03-E		
		5 m	JEPMC-W6002-05-E		
		10 m	JEPMC-W6002-10-E		
		20 m	JEPMC-W6002-20-E		
		30 m	JEPMC-W6002-30-E		
		40 m	JEPMC-W6002-40-E		
		50 m	JEPMC-W6002-50-E		
	Terminator		JEPMC-W6022-E	Units: mm 	
To CN5 Cable for Analog Monitor		1 m	JZSP-CA01-E	To SERVOPACK 	(3)

Selecting Cables Units: mm

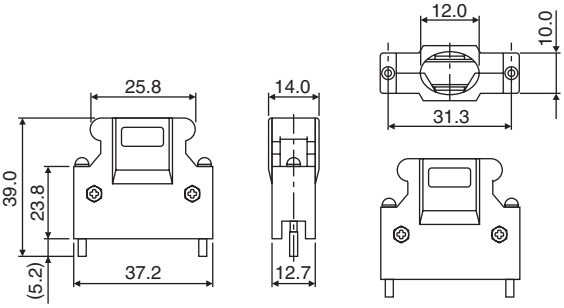
(1) Connector Kit (for CN1)

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

Connector Kit Model No.	Case		Connector	
	Model No.	Qty	Model No.	Qty
JZSP-CSI9-2-E (DE9411354)	10326-52A0-008*	1 set	10126-3000PE* (Soldered)	1

*: Manufactured by Sumitomo 3M Ltd.

・Dimensional Drawings of Case

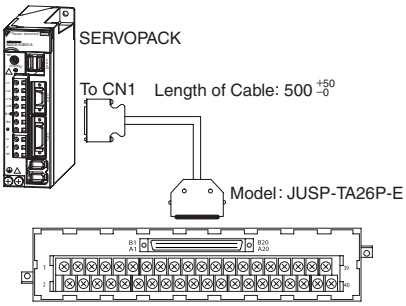


・Cable Size

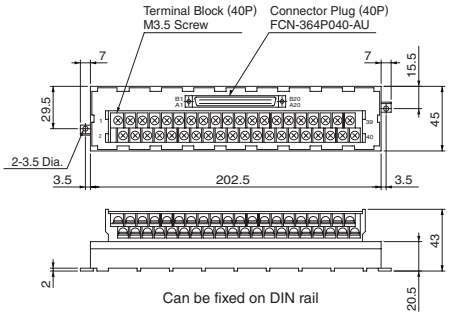
Item	Specifications
Cable	Use twisted-pair or twisted-pair shielded wire.
Applicable wires	AWG24, 26, 28, 30
Cable finished diameter	16 mm max.

(2) Connecter Terminal Block Converter Unit with a Cable (to CN1)

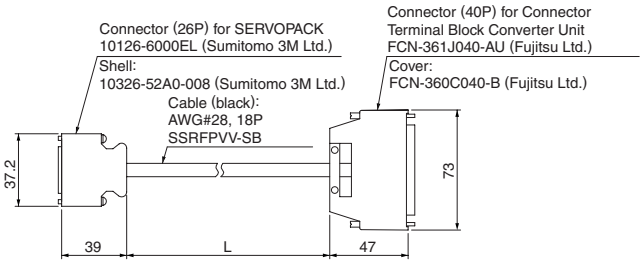
・Cable Connection



・Dimensional Drawings of Terminal Block



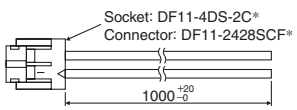
・Dimensional Drawings of Cable



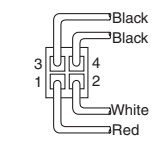
Terminal Block Model	Length of Cable	Approx. Mass
JUSP-TA26P-E	0.5 m	100 g
JUSP-TA26P-1-E	1 m	200 g
JUSP-TA26P-2-E	2 m	400 g

(3) Cables for Analog Monitor (to CN5)

・Dimensional Drawings



*: Manufactured by Hirose Electric Corporation.



Viewed from the Cable

・Specifications

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

Note: The examples shown in the table are factory settings. To change the settings, use parameters Pn006 and Pn007.

Selecting Cables

● Main Circuit Cables

(1) Single-phase for 100 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-			
		A3B	A5F	01F	02F
Main Circuit Power Input Terminals	L1, L2	HIV1.25			HIV2.0
Servomotor Connection Terminals	U, V, W	HIV1.25			
Control Power Input Terminals	L1C, L2C	HIV1.25			
External Regenerative Resistor Connection Terminals	B1 / ⊕, B2	HIV1.25			
Ground Terminal	⏚	HIV2.0 min.			

(2) Single-phase for 200 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-				
		A5A	01A	02A	04A	08A
Main Circuit Power Input Terminals	L1, L2	HIV1.25			HIV2.0	
Servomotor Connection Terminals	U, V, W	HIV1.25				
Control Power Input Terminals	L1C, L2C	HIV1.25				
External Regenerative Resistor Connection Terminals	B1 / ⊕, B2	HIV1.25				
Ground Terminal	⏚	HIV2.0 min.				

(3) Three-phase for 200 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-							
		05A	10A	15A	20A	30A	50A	60A	75A
Main Circuit Power Input Terminals	L1, L2, L3	HIV2.0			HIV3.5		HIV5.5	HIV8.0	HIV14
Servomotor Connection Terminals	U, V, W	HIV2.0			HIV3.5	HIV5.5	HIV8.0	HIV14	
Control Power Input Terminals	L1C, L2C	HIV1.25							
External Regenerative Resistor Connection Terminals	B1 / ⊕, B2*	HIV1.25			HIV2.0	HIV3.5	HIV5.5	HIV8.0	
Ground Terminal	⏚	HIV2.0 min.							

*: For SGDS-60A and -75A SERVOPACKs, the external regenerative resistor connection terminals are B1 and B2.

The table shows the wire size and allowable current for three cables. Use a cable whose specifications meet or are less than the values in the table.

・600 V Heat-resistant Vinyl Cable (HIV)

AWG Size	Nominal Cross Section Diameter mm²	Configuration Number of Wires/mm²	Conductive Resistance Ω/km	Allowable Current at Surrounding Air Temperatures (A)		
				30℃	40℃	50℃
20	0.5	19/0.18	39.5	6.6	5.6	4.5
—	0.75	30/0.18	26.0	8.8	7.0	5.5
18	0.9	37/0.18	24.4	9.0	7.7	6.0
16	1.25	50/0.18	15.6	12.0	11.0	8.5
14	2.0	7/0.6	9.53	23	20	16
12	3.5	7/0.8	5.41	33	29	24
10	5.5	7/1.0	3.47	43	38	31
8	8.0	7/1.2	2.41	55	49	40
6	14.0	7/1.6	1.35	79	70	57

Note: The values in the table are only for reference.

IMPORTANT

1 Wire sizes are selected for three cables per bundle at 40℃ surrounding air temperature with the rated current.
2 Use cable with minimum withstand voltage of 600 V for main circuits.
3 If cables are bundled in PVC or metal ducts, consider the reduction ratio of the allowable current.
4 Use heat-resistant cable under high ambient or panel temperatures where normal vinyl cable will rapidly deteriorate.
5 Use cable within the allowable moment of inertia.
6 Do not use cables in continuous regenerating status.

Selecting Cables Units: mm

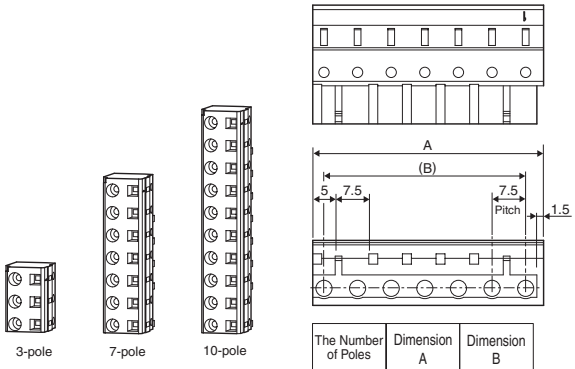
● Connectors of Main Circuit and Control Power Supply Cables and Servomotor Cable

(1) Spring Type (Standard)

・Connector Types

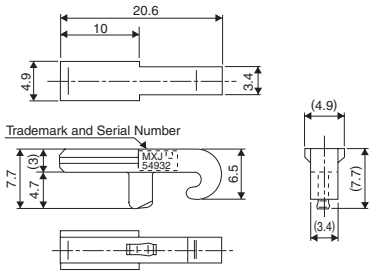
Appearance	Order No.	Manufacturer
3-pole (For servomotor main circuit cable connector to SERVOPACK)	51446-0301	Molex Japan Co., Ltd.
7-pole (For 50 W to 400 W SERVOPACKs)	51446-0701	
10-pole (For 0.5 kW to1.5 kW SERVOPACKs)	51446-1001	
Connection lever	54932-0000	

・External View and Dimensions



The Number of Poles	Dimension A	Dimension B
3	21.5	15
7	51.5	45
10	74	67.5

・Connection Lever



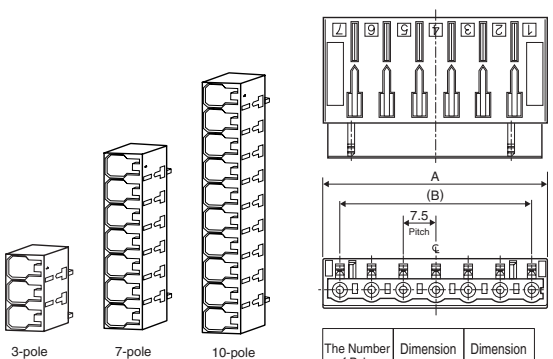
(2) Crimp Type (Optional)

The crimp type connectors are optional. Contact the manufacturer for details.

・Connector Types

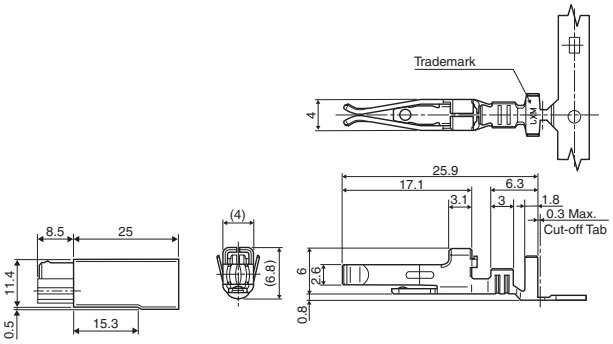
Appearance	Order No.	Manufacturer
3-pole (For servomotor main circuit cable connector to SERVOPACK)	51241-0301	Molex Japan Co., Ltd.
7-pole (For 50 W to 400 W SERVOPACKs)	51241-0701	
10-pole (For 0.5 kW to1.5 kW SERVOPACKs)	51241-1001	
Plug (chained)	56125-0018	
Plug (detached)	56125-0118	
Manual tool	57349-5300	
Pull tool	57349-6000	

・External View and Dimensions



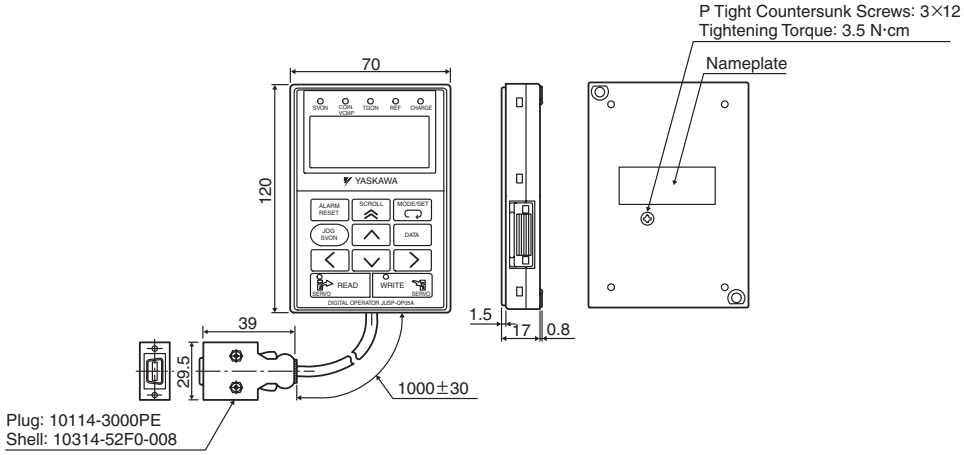
The Number of Poles	Dimension A	Dimension B
3	22.8	15
7	52.8	45
10	75.3	67.5

・Plugs (Chained/Detached)



Selecting Peripheral Devices Units: mm

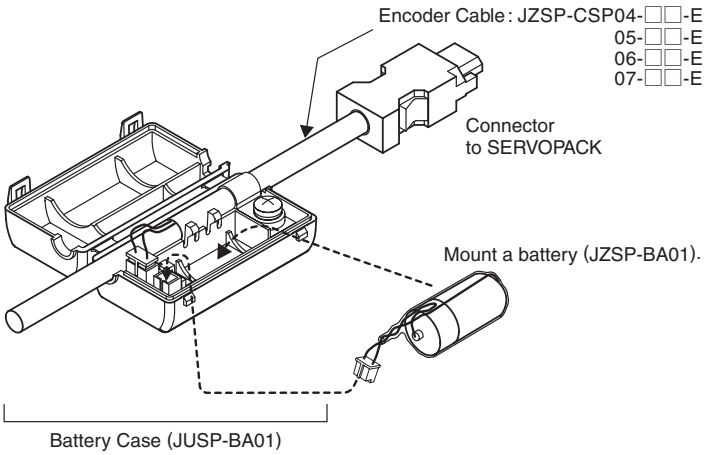
● Digital Operator (Model:JUSP-OP05A)



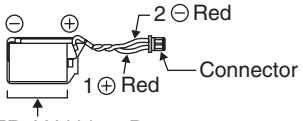
● Battery Case (Model:JUSP-BA01)

IMPORTANT

1 The battery case (JUSP-BA01) is not provided with a battery. A battery must be purchased separately.
2 Install the battery case where the surrounding air temperature is between 0℃ to 55℃.

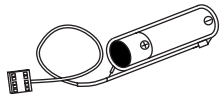


(1) Mounting a Battery in a Battery Case
Prepare a lithium battery (JZSP-BA01) and mount in a battery case.



ER3V Lithium Battery
(3.6 V, 1000 mAh, Manufactured by Toshiba Battery Co., Ltd.)

(2) Connecting a Battery to the Host Controller
Use a battery that meets the specifications of the host controller. Use an ER6VC3N (3.6 V, 2000 mAh, manufactured by Toshiba Battery Co., Ltd.) or equivalent battery.



Selecting Peripheral Devices

● Molded-case Circuit Breaker and Fuse Capacity

Main Circuit Power Supply	SERVOPACK Model		Power Supply Capacity per SERVOPACK kVA	Current Capacity of Molded-case Circuit Breaker or Fuse *1, *2		Inrush Current	
	Capacity kW	SGDS-		Main Circuit Power Supply Arms	Control Circuit Power Supply Arms	Main Circuit Power Supply A	Control Circuit Power Supply A
Single-phase 100 V	0.03	A3B	0.25	4	0.26	14	30
	0.05	A5F					
	0.10	01F	0.40				
	0.20	02F	0.60	6			
	0.40	04F	1.2	12			
Single-phase 200 V	0.05	A5A	0.25	4	0.13	28	60
	0.10	01A	0.40				
	0.20	02A	0.75				
	0.40	04A	1.2	8			
	0.80	08A	2.2	16			
Three-phase 200 V	0.5	05A	1.4	4	0.15	28	60
	1.0	10A	2.3	7			
	1.5	15A	3.2	10			28
	2.0	20A	4.3	13			
	3.0	30A	5.9	17			
	5.0	50A	7.5	28		57	
	6.0	60A	12.5	32	0.27	94	
	7.5	75A	15.5	41			

*1: Nominal value at the rated load. The specified derating is required to select an appropriate fuse capacity.
*2: Cut-off characteristics (25°C): 200% for two seconds min. and 700% for 0.01 seconds min.
Note: Do not use a fast-acting fuse. Because the SERVOPOACK's power supply is a capacitor input type, a fast-acting fuse may blow when the power is turned on.

If selecting a molded-case circuit breaker, observe the following precautions.

IMPORTANT

■Ground Fault Detector
- Select ground fault detectors for inverters.
- High-frequency current leaks from the servomotor armature because of switching operation inside the SERVOPACK.

(1) Maximum Input Current
- The instantaneous maximum output of the SERVOPACK is approximately 3 times the rated output for a maximum of 3 seconds. Accordingly, select a molded-case circuit breaker whose breaking time is 5 seconds or more at 300% of SERVOPACK rated current. The general-purpose low-speed acting molded-case circuit breakers are applicable.
- The power supply capacity per SERVOPACK when using a servomotor is described in the table above. Select a molded-case circuit breaker with the capacity larger than the effective load current (when using multiple SERVOPACKs) calculated from the total power supply capacity .
- The consumption of other controllers must be considered when selecting a molded-case circuit breaker.

(2) Inrush Current
- Refer to the table above for SERVOPACK inrush current.
- The allowable inrush current for a low-speed acting molded-case circuit breaker is approximately 10 times the rated current for 0.02 seconds.
- When turning on multiple SERVOPACKs simultaneously, select a molded-case circuit breaker with the allowable current for 20 ms larger than the total inrush current shown in the table above.

Selecting Peripheral Devices

● Noise Filters, Magnetic Contactors, Surge Absorbers, and AC/DC Reactors

Main Circuit Power Supply	SERVOPACK Model		Recommended Noise Filter		Magnetic Contactor	Surge Absorber	AC/DC Reactor
	Capacity kW	SGDS-	Model No.	Specifications			
Single-phase 100 V	0.03	A3B	FN2070-6/07	Single-phase 250 VAC, 6 A	SC-03	R・C・M -601BQZ-4	X5052
	0.05	A5F					X5053
	0.10	01F					
	0.20	02F	FN2070-10/07	Single-phase 250 VAC, 10 A			X5054
	0.40	04F	FN2070-16/07	Single-phase 250 VAC, 16 A	SC-4-1		X5056
Single-phase 200 V	0.05	A5A	FN2070-6/07	Single-phase 250 VAC, 6 A	SC-03		X5052
	0.10	01A					
	0.20	02A					X5053
	0.40	04A	FN2070-10/07	Single-phase 250 VAC, 10 A			X5054
	0.80	08A	FN2070-16/07	Single-phase 250 VAC, 16 A	SC-4-1		X5056
Three-phase 200 V	0.5	05A	FN258L-7/07	Three-phase 480 VAC, 7 A	SC-03	R・C・M -601BUZ-4	X5061
	1.0	10A	FN258L-16/07	Three-phase 480 VAC, 16 A	SC-4-1		
	1.5	15A					X5060
	2.0	20A			SC-5-1		
	3.0	30A	FN258L-30/07	Three-phase 480 VAC, 30 A			X5059
	5.0	50A	FMAC-0934-5010	Three-phase 480VAC, 50 A	SC-N1		X5068
	6.0	60A		Three-phase 440 VAC, 50 A			—
	7.5	75A	FMAC-0953-6410	Three-phase 440 VAC, 64 A	SC-N2		—
Details			(1)		(2)	(3)	(4)

Notes: 1 If some SERVOPACKs are wired at the same time, select the proper magnetic contactors accroding to the total capacity.
2 The following table shows the manufacturers of each device.

Peripheral Device	Manufacturer
Noise Filter	FN type: Schaffner EMC, Inc.
	FMAC type: Schurter Inc. (formerly Timonta)
Magnetic Contactor	Fuji Electric FA Components & Systems Co., Ltd.
Surge Absorber	Okaya Electric Industries Co., Ltd. (Surge Protector)
AC/DC Reactor	Yaskawa Controls Co., Ltd.

IMPORTANT

■Noise Filter for Brake Power Supply

Use the following noise filter at the brake power input for 400 W or less servomotors with holding brakes.

Model No.: FN2070-6/07 (Manufactured by Schaffner EMC, Inc.)

Selecting Peripheral Devices

● Regenerative Resistors and Brake Power Supply Units

Main Circuit Power Supply	SERVOPACK Model		Regenerative Resistor			Brake Power Supply Unit
	Capacity kW	SGDS-	Built-in		Externally Connected	
			Resistance Ω	Capacity W		
Single-phase 100 V	0.03	A3B	None	None	—	For 24 VDC brakes*3 To be provided by the customer.
	0.05	A5F				For 24 VDC brakes*3 To be provided by the customer.
	0.10	01F				
	0.20	02F				
	0.40	04F				
Single-phase 200 V	0.05	A5A	None	None	—	For 90 VDC brakes ・LPDE-1H01-E for 100 VAC input ・LPSE-2H01-E for 200 VAC input
	0.10	01A				
	0.20	02A				
	0.40	04A				
	0.80	08A	50	60		
Three-phase 200 V	0.45	05A	50	40	—	
	1.0	10A		60		
	1.5	15A	20	50		
	2.0	20A	12	80		
	3.0	30A				
	5.0	50A	8	180	—	
	6.0	60A	(6.25)*1	(880)*1	JUSP-RA04	
	7.5	75A	(3.13)*2	(1760)*2	JUSP-RA05	
Details			(5)			(6)

*1 : For the optional JUSP-RA04 Regenerative Resistor Unit.
*2 : For the optional JUSP-RA05 Regenerative Resistor Unit.
*3 : If using a commercially available power supply for the 24-VDC brake, install a surge suppressor to protect the power supply from overvoltage. If a surge suppressor is not used, the power supply may be damaged if an overvoltage, such as a surge, occurs in the output section.

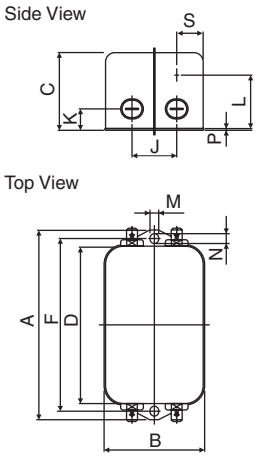
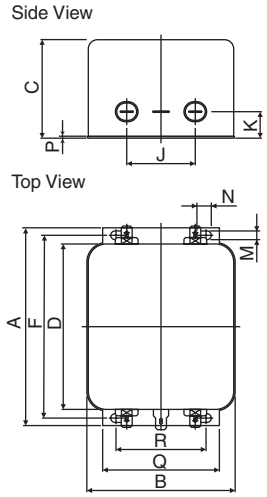
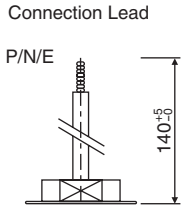
Notes: 1 If the SERVOPACK cannot process the regenerative power, an external regenerative resistor is required. External regenerative resistors are required for SERVOPACKs with a capacity of 6.0 kW or more as a standard safety measure.
2 The following table shows the manufacturers of each device.

Peripheral Device	Manufacturer
External Regenerative Resistor	Iwaki Musen Kenkyusho. Co., Ltd.
External Regenerative Unit	Yaskawa Electric Corporation
Brake Power Supply Unit	Yaskawa Controls Co., Ltd.

(1) Noise Filter

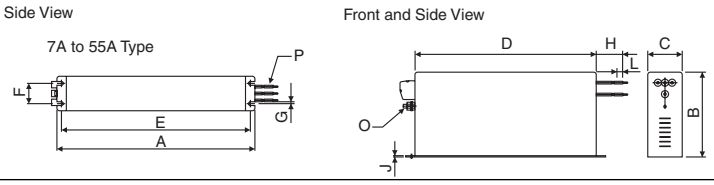
The recommended noise filter is manufactured by Schaffner EMC, Inc. (FN type) and Schurter, Inc. (formerly Timonta) (FMAC type).

・FN Type for Single-phase 100/200 V

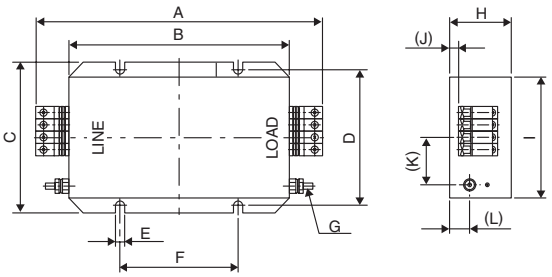
Model No.		FN2070-6/07	FN2070-10/07	FN2070-16/07
Dimensional Drawings				
				
External Dimensions	Symbol	Dimensions in mm		
	A	113.5±1	156±1	119±0.5
	B	57.5±1		85.5±1
	C	45.4±1.2		57.6±1
	D	94±1	130.5±1	98.5±1
	F	103±0.3	143±0.3	109±0.3
	J	25±0.2		40±0.2
	K	8.4±0.5		8.6±0.5
	L	32.4±0.5		–
	M	4.4±0.1	5.3±0.1	4.4±0.1
	N	6±0.1		7.4±0.1
	P	0.9±0.1		1.2±0.1
	Q	–		66±0.3
	R	–		51±0.2
	S	38±0.5		–
Specifications		250 VAC, 6 A	250 VAC, 10 A	250 VAC, 16 A
Applicable SERVOPACK SGDS-	Single-phase 100 V	A5F	02F	04F
		01F		
	Single-phase 200 V	A5A	04A	08A
		01A		
		02A		
Manufacturer		Schaffner EMC, Inc.		

Selecting Peripheral Devices

・FN Type for Three-phase 200 V

Model No.		FN258L-7/07	FN258L-16/07	FN258L-30/07
Dimensional Drawings				
External Dimensions	Symbol	Dimensions in mm		
	A	225±1	305±1	335±1
	B	126±0.8	142±0.8	150±1
	C	50±0.6	55±0.6	60±0.6
	D	225±0.8	275±0.8	305±1
	E	240±0.5	290±0.5	320±0.5
	F	25±0.3	30±0.3	35±0.3
	G	6.5±0.2		
	H	300±10		400±10
	J	1±0.1		
	L	9±1		
	O	M5		
	P	AWG16	AWG14	AWG10
Specifications		480 VAC, 7 A	480 VAC, 16 A	480 VAC, 30 A
Applicable SERVOPACK SGDS-	Three-phase 200 V	05A	10A, 15A, 20A	30A
Manufacturer		Schaffner EMC, Inc.		

・FMAC Type for Three-phase 200 V

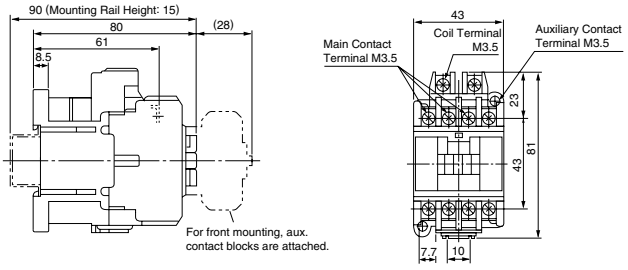
Model No.		FMAC-0934-5010	FMAC-0953-6410
Dimensional Drawings			
External Dimensions	Symbol	Dimensions in mm	
	A	251	308
	B	201	231
	C	151	151
	D	135^{+0}_{-1}	135^{+0}_{-1}
	E	6.5±0.3	6.5±0.3
	F	115±0.3	115±0.3
	G	M6	M6
	H	66	66
	I	121	121
	J	(10)	(13)
	K	(41)	(45)
	L	(17)	(34)
Specifications		440 VAC, 50 A	440 VAC, 64 A
Applicable SERVOPACK SGDS-	Three-Phase 200 V	50A 60A	75A
Manufacturer		Schurter EMC, Inc. (formerly Timonta)	

(2) Magnetic Contactor

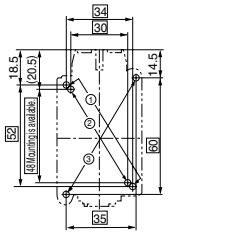
A magnetic contactor is required to externally activate the AC power for the SERVOPACK.
Be sure to attach a surge absorber to the excitation coil of the magnetic contactor.

・Model: SC-03

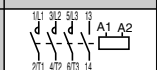
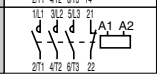
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.32 kg

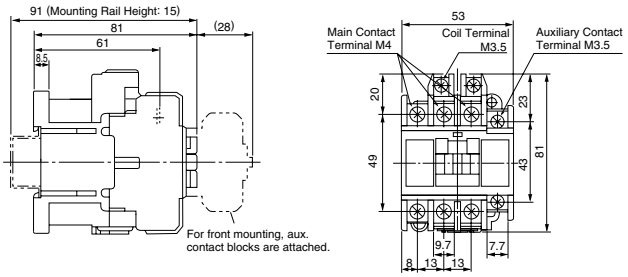


●Mounting methods: The following methods ①, ②, ③ are available.
①··· 34 × (48 to) 52
②··· 30 × 48
③··· 35 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

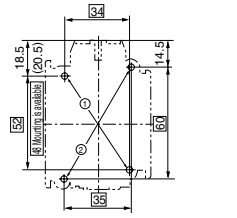
Auxiliary Contact	Structure
1a	
1b	

・Model: SC-4-1

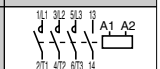
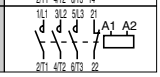
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.36 kg

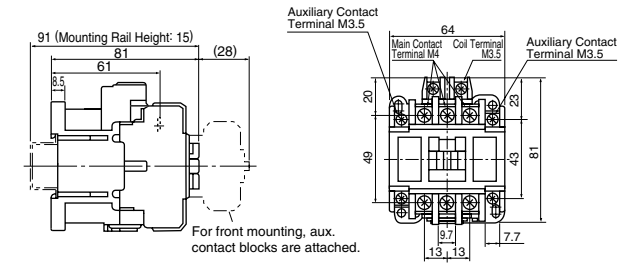


●Mounting methods: The following methods ①, ② are available.
①··· 34 × (48 to) 52
②··· 35 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

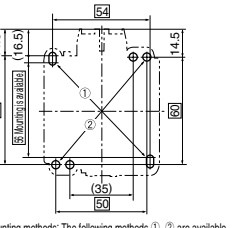
Auxiliary Contact	Structure
1a	
1b	

・Model: SC-5-1

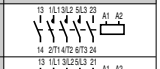
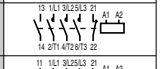
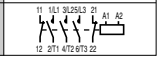
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.38 kg

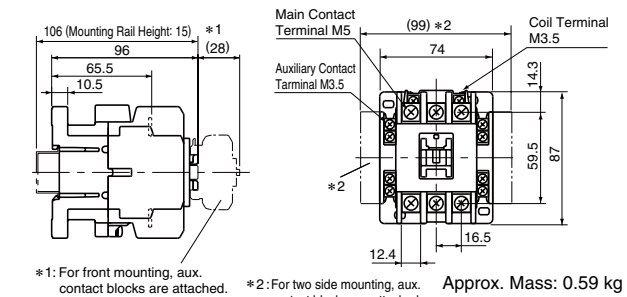


●Mounting methods: The following methods ①, ② are available.
①··· 54 × (56 to) 60
②··· 50 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

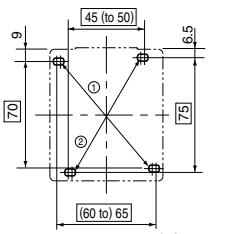
Auxiliary Contact	Structure
2a	
1a1b	
2b	

・Model: SC-N1, SC-N2

External Dimensions	Mounting Hole Dimensions	Terminal Symbols

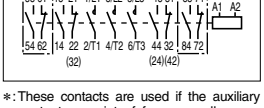


Approx. Mass: 0.59 kg



●Mounting methods: The following methods ①, ② are available.
①··· (60 to) 65 × 70
②··· 45 (to 50) × 75
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

Structure



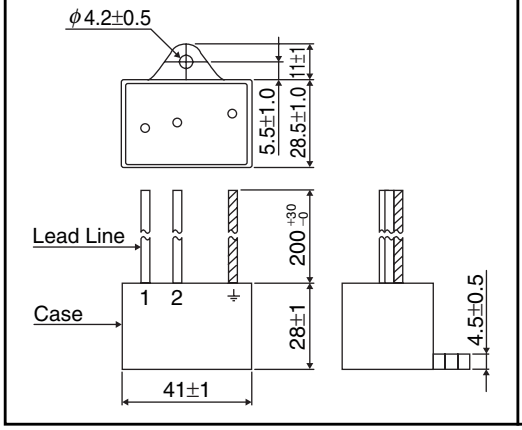
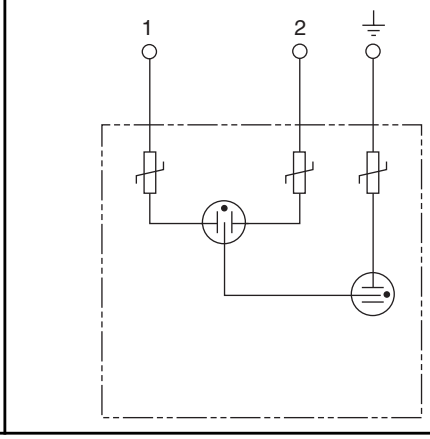
∗: These contacts are used if the auxiliary contacts consist of four normally open (NO) and four normally close (NC) contacts.
Note: The terminals of the auxiliary contacts are numbered differently than conventional terminals. The numbers in parentheses use the conventional method.

Selecting Peripheral Devices Units: mm

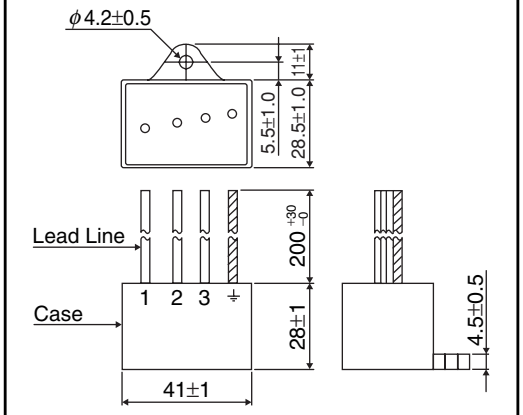
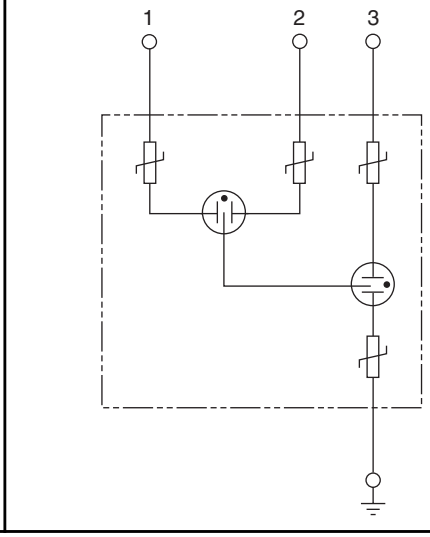
(3) Surge Absorber

The surge absorber absorbs switching surge and prevents faulty operation in or damage to electronic circuits. Recommended surge absorbers (for lightning surge) are listed below.

・Model: R・C・M-601BQZ-4

Dimensional Drawings	Internal Connection Diagram
	

・Model: R・C・M-601BUZ-4

Dimensional Drawings	Internal Connection Diagram
	

(4) AC/DC Reactors for Power Supply Harmonic Suppression

Manufactured by Yaskawa Controls Co., Ltd. Contact your Yaskawa representative for details.

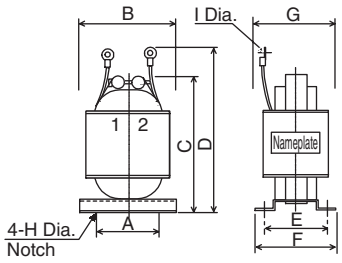
If the power supply harmonic suppression is needed, connect an AC reactor to the AC line for the single-phase input, or connect a DC reactor between the SERVOPACK main circuit terminals ⊖1 and ⊖2 for the three-phase input.

Select a reactor that matches the ratings of the SERVOPACK.

・Specifications

Applicable SERVOPACK Model SGDS-		AC/DC Reactor Model	Reactor Specifications	
			Inductance mH	Rated Current A
Single-phase 100 V	A3B	X5052	45.0	1.0
	A5F	X5053	20.0	2.0
	01F			
	02F	X5054	5.0	3.0
	04F	X5056	2.0	5.0
Single-phase 200 V	A5A	X5052	45.0	1.0
	01A			
	02A	X5053	20.0	2.0
	04A	X5054	5.0	3.0
	08A	X5056	2.0	5.0
Three-phase 200 V	05A	X5061	2.0	4.8
	10A			
	15A	X5060	1.5	8.8
	20A			
	30A	X5059	1.0	14.0
	50A	X5068	0.47	26.8
	60A	–	–	–
	75A			

・Dimensional Drawings



Reactor Model	Dimensions in mm									Approx. Mass kg
	A	B	C	D	E	F	G	H	I	
X5052	35	52	80	95	30	40	45	4	4.3	0.4
X5053	35	52	90	105	35	45	50	4	4.3	0.6
X5054	35	52	80	95	30	40	45	4	4.5	0.4
X5056	35	52	80	95	30	40	45	4	4.3	0.4
X5059	50	74	125	140	35	45	60	5	5.3	1.1
X5060	40	59	105	125	45	60	65	4	4.3	1.0
X5061	35	52	80	95	35	45	50	4	4.3	0.5
X5068	50	74	125	155	53	66	75	5	6.4	1.9

Selecting Peripheral Devices

(5) External Regenerative Resistor

When regenerative energy is so large that a SERVOPACK cannot process, install externally a regenerative resistor. The regenerative resistor must be provided by the customers. Refer to the table below for selecting the regenerative resistor.

SERVOPACK Capacity	Necessity of External Regenerative Resistors	Descriptions
400 W or less	Not Required	No built-in regenerative resistor is provided, however, normally an external regenerative resistor is not required. Install external regenerative resistors when the smoothing capacitor in SERVOPACK cannot process all the regenerative power.
0.5 kW to 5.0 kW	Not Required	A built-in regenerative resistor is provided as standard. Install external regenerative resistors when the built-in regenerative resistor cannot process all the regenerative power.
6.0 kW to 7.5 kW	Required	No built-in regenerative resistor is provided, so the external regenerative resistor is required. If the external regenerative resistor is not connected with the SERVOPACK, the alarm A.300 is detected as a regeneration error alarm.

① Example:External Regenerative Resistor (by Iwaki Musen Kenkyusho Co., Ltd.)

Regenerative Resistor Model	Specifications
RH120	70 W, 1 to 100Ω
RH150	90 W, 1 to 100Ω
RH220	120 W, 1 to 100Ω
RH330C	200 W, 1 to 10kΩ
RH500	300 W, 1 to 30Ω

・Specifications

Resistance Tolerance	K: ±10%, J: ±5%, H: ±3%
Temperature Resistance Characteristics	±400 PPM/℃ (20Ω max.), ±260 PPM/℃ (20Ω min.)
Withstand Voltage	2000 VAC/min, △R: ±(0.1% + 0.05Ω)
Insulation Resistance	500 VDC, 20MΩ min.
Short-time Overload	When 10 times the rated power is applied for five seconds, △R: ±(2% + 0.05Ω)
Life	1000 hours of repeating the operation ON for 90 minutes and OFF for 30 minutes, △R: ±(5% + 0.05Ω)
Heat Resistance	Not ignite after having applied 10 times the rated electric power for one minute
Operating temperature	−25℃ to 150℃

・Model Designation

RH120 (N) 10Ω J

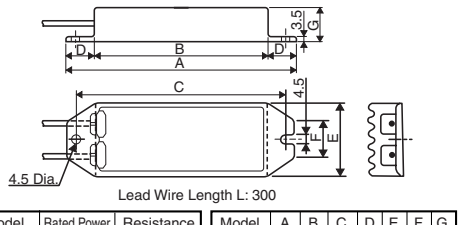
Model
N: Noninductive Winding

Resistance

Resistance Tolerance	
Code	Specification
K	±10%
J	±5%
H	±3%

・External Dimensions

RH120, 150, 220

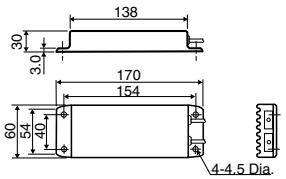


Lead Wire Length L: 300

Model	Rated Power	Resistance
RH120	70 W	1Ω to 100Ω
RH150	90 W	1Ω to 100Ω
RH220	120 W	1Ω to 100Ω

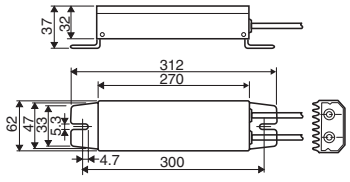
Model	A	B	C	D	E	F	G
RH120	182	150	172	16	42	22	20
RH150	212	180	202	16	44	24	30
RH220	230	200	220	15	60	24	20

RH220B



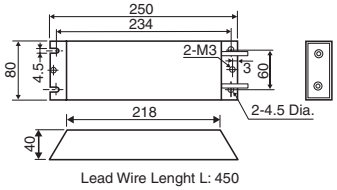
Lead Wire Length L: 500
Rated Power: 120 W
Resistance: 1Ω to 100Ω

RH300C



Lead Wire Length L: 300
Rated Power: 200 W
Resistance: 1Ω to 10kΩ

RH500



Lead Wire Lenght L: 450
Rated Power: 300 W
Resistance: 1Ω to 30Ω

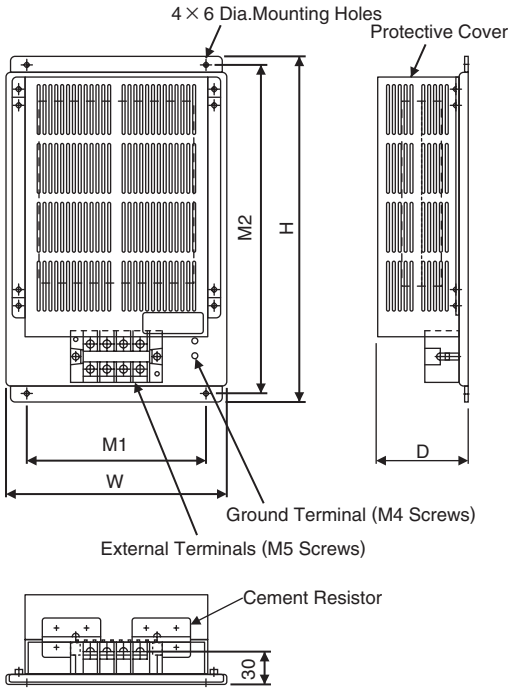
(5) External Regenerative Resistor

② Regenerative Resistor Unit

The SERVOPACKs with a capacity of 6.0 kW or more do not have a built-in regenerative resistor. The following regenerative resistor unit is required according to the SERVOPACK model.

SERVOPACK Model	Regenerative Resistor Unit Model	Specifications	Allowable Power Loss
SGDS-60A	JUSP-RA04	6.25Ω, 880 W	180 W
SGDS-75A	JUSP-RA05	3.13Ω, 1760 W	350 W

・External Dimensions



Model	W	H	D	M1	M2	Approx. Mass
JUSP-RA04	220	350	92	180	335	4 kg
JUSP-RA05	300	350	95	250	335	7 kg

(6) Brake Power Supply Unit

200 V input: LPSE-2H01-E

100 V input: LPDE-1H01-E

・Specifications

Rated output voltage: 90 VDC

Maximum output current: 1.0 A DC

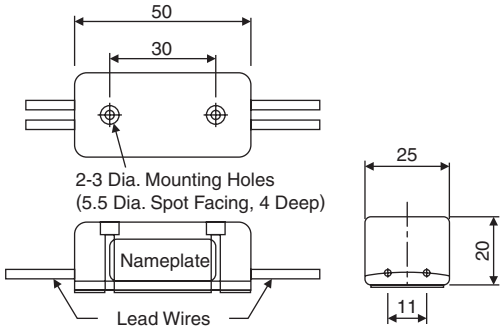
Lead wire length: 500 mm each

Maximum surrounding air temperature: 60℃

Lead wires: Color coded. Refer to the table below.

To AC Input		To Brake
100 V	200 V	
Blue / White	Yellow / White	Red / Black

・External Dimensions

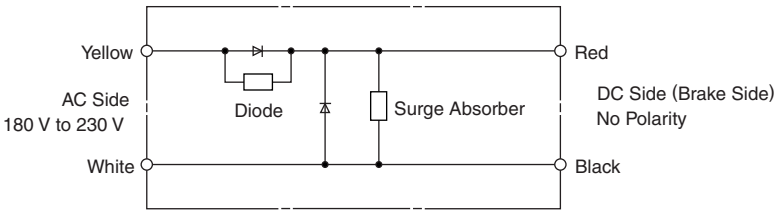


Selecting Peripheral Devices Units: mm

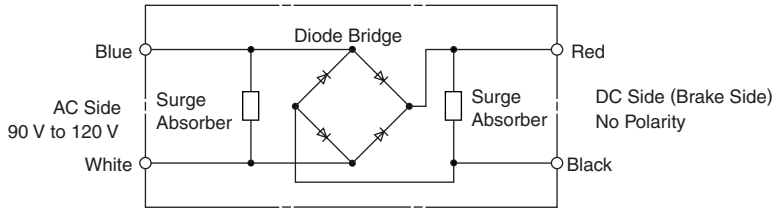
・Internal Circuits

Open or close the circuit for the brake power supply on the AC side of the brake power suppy unit.
When switching on the DC side, install a surge absorber near the brake coil to prevent damage to the brake coil from voltage surges due to DC-side switching.

Internal Circuit for 200 VAC
Brake Power Supply Model: LPSE-2H01-E



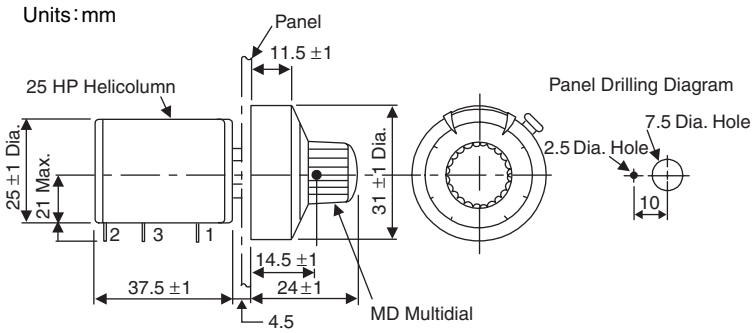
Internal Circuit for 100 VAC
Brake Power Supply Model: LPDE-1H01-E



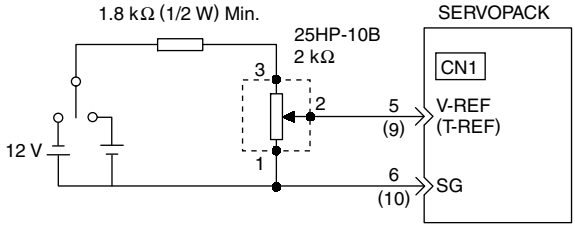
(7) Variable Resistor for Speed and Torque Setting (Model: 25HP-10B)

The multi-turn type winding variable resistors with dial MD10-30B4 are manufactured by Sakae Tsushin Kogyo Co., Ltd.

・External Dimensions

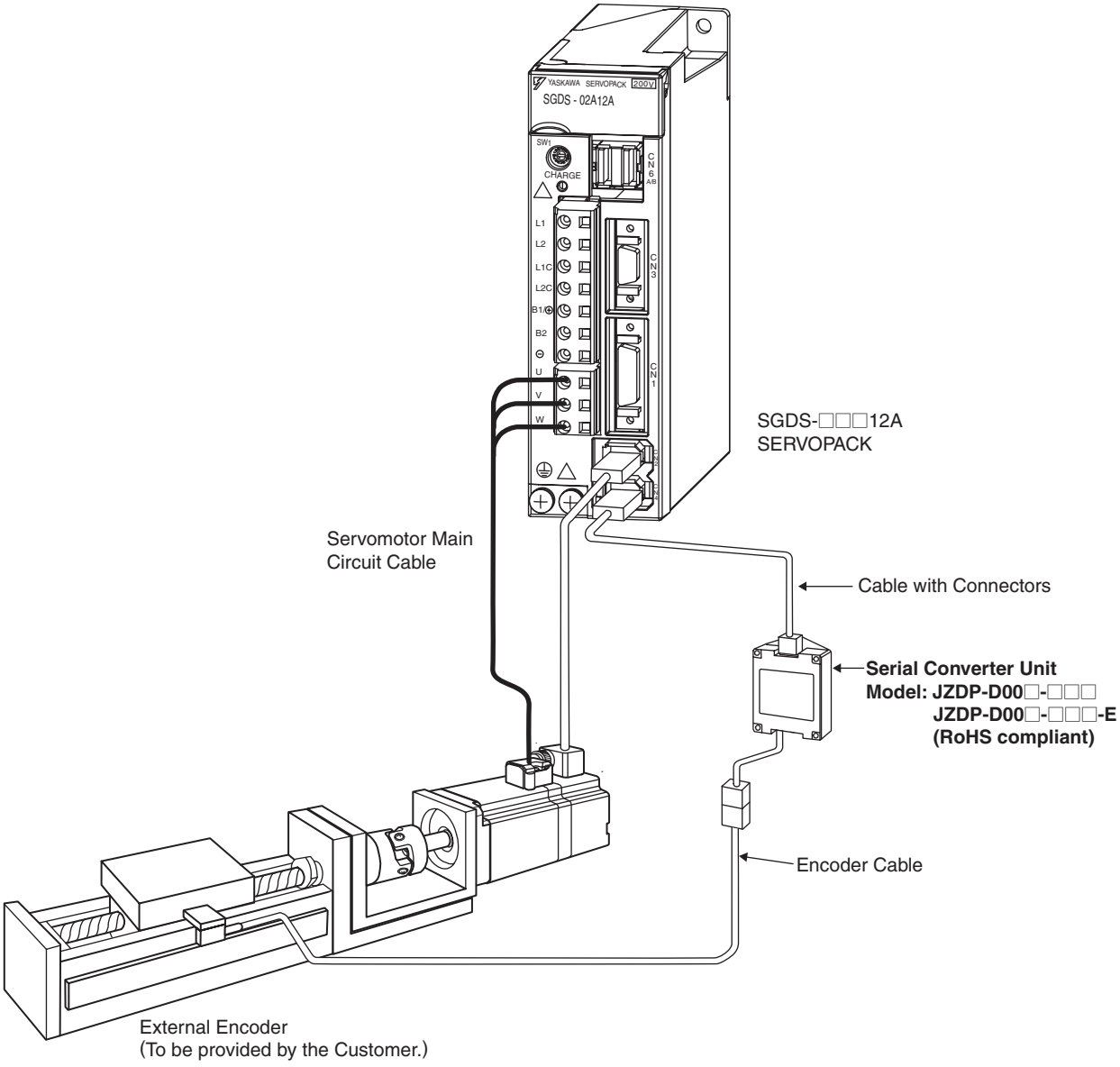


・Connection Example to an External Power Supply



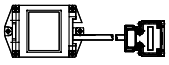
Serial Converter Units for Fully-closed Control

● System Configuration for Fully-closed Control



● Model Designation

JZDP - D00□ - 000 - E

Serial Converter Unit Model			
Symbol	Appearance	Applicable Linear Scale	Hall Sensor
D003		Made by HEIDENHAIN Corporation	None
D005		Made by Renishaw plc.	None

Code	Specifications
None	Not RoHS compliant
E	RoHS compliant

Note: Using the serial converter unit JZDP-A□□□ with SGDS SERVOPACK will void our guarantee.

Serial Converter Units for Fully-closed Control

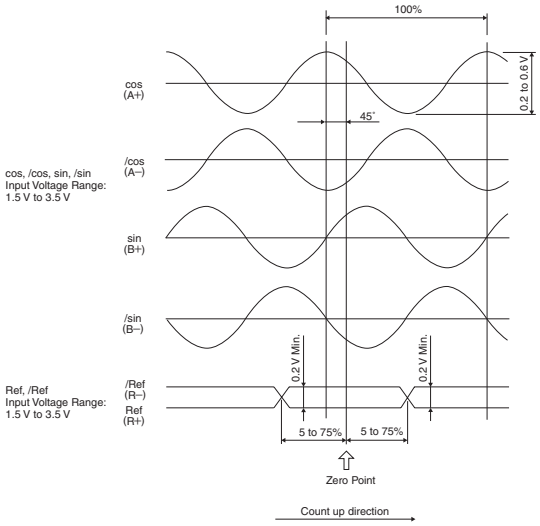
● Characteristics and Specifications

Items		Specifications
Electrical Characteristics	Power Supply Voltage	+5.0 V±5%, ripple content 5% max.
	Current Consumption*1	120 mA typ., 350 mA max.
	Signal Resolution	Input 2-phase sine wave: 1/256 pitch
	Max. Response Frequency	250 kHz
	Analog Input Signals*2 (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V
	Output Signal*3	Position data, alarms
	Output Method	Serial data communications [HDLC (High-level Data Link Control) protocol format with Manchester codes]
	Transmission Cycle	62.5 μs
	Output Circuit	Balanced type transceiver (SN75LBC176 or the equivalent), internal terminating resistor: 120 Ω
Mechanical Characteristics	Approx. Mass	150g
	Vibration Resistance	98 m/s² max. (10 to 2500 Hz) in three directions
	Shock Resistance	980 m/s², (11 ms) two times in three directions
Environmental Conditions	Operating Temperature	0℃ to 55℃
	Storage Temperature	−20℃ to+80℃
	Humidity	20% to 90% RH (no condensation)

*1: The current consumption of the linear scale is not included in this value.
The current consumption of the linear scale must be taken into consideration for the current capacity of host controller that supplies the power.
*2: Input a value within the specified range. Otherwise, incorrect position information is output, and the device may be damaged.
*3: The transmission is enabled 100 to 300 ms after the power turns on.

● Analog Signal Input Timing

The following figure shows the input timing of the analog signals.
When the cos and sin signals are shifted 180 degrees, the differential signals are the /cos and /sin signals.
The specifications of the cos, /cos, and /sin signals are identical except for the phase.
Input the signals Ref and /Ref so that they shall cross each other as shown in the figure because they are input into the converter. When they are crossed, the output data will be counted up.



IMPORTANT

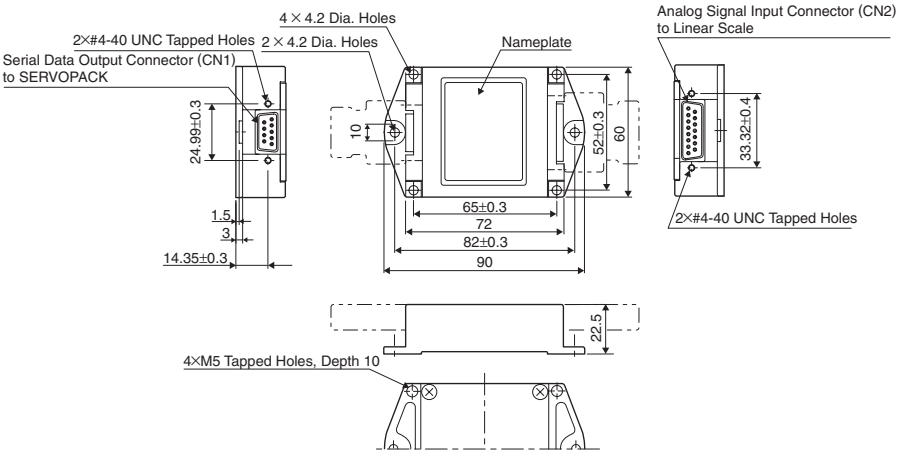
■Precautions

1 Never perform insulation resistance and withstand voltage tests.
2 When analog signals are input to the serial converter unit, noise influence on the analog signals affects the unit's ability to output correct position information. The analog cable must be as short as possible and shielded.
3 Do not connect or disconnect the unit while power is being supplied, or the unit may be damaged.
4 When using multiple axes, use a shield cable for each axis. Do not use a shield cable for multiple axes.

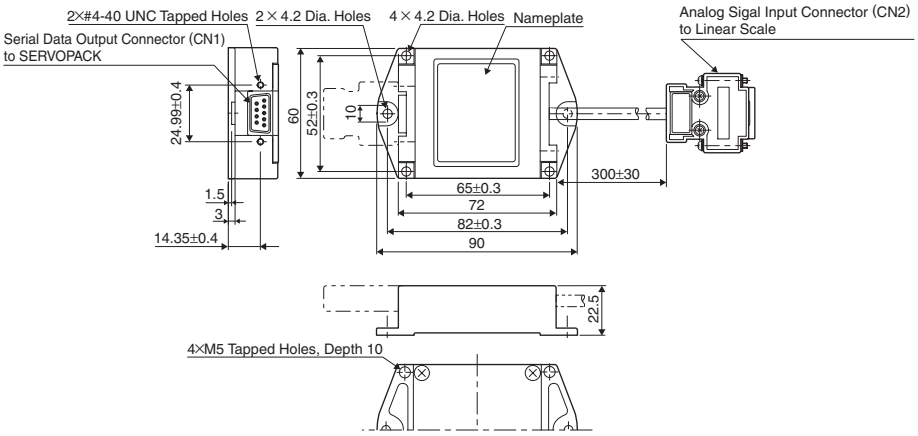
Serial Converter Units for Fully-closed Control Units: mm

● External Dimensions

(1) Model: JZDP-D003-□□□
JZDP-D003-□□□-E(RoHS compliant)



(2) Model: JZDP-D005-□□□
JZDP-D005-□□□-E(RoHS compliant)

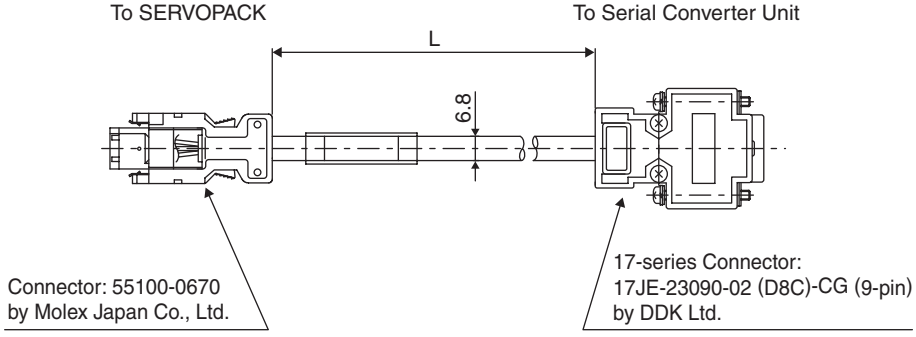


● Connection Cable between SERVOPACK and Serial Converter Unit

・Recommended Cables

Name	Application	Model No.	Length
Cable with Connectors	Connection between SERVOPACK Connector CN4 and Serial Converter Unit	JZSP-CLP20-03-E	3 m
		JZSP-CLP20-05-E	5 m
		JZSP-CLP20-10-E	10 m
		JZSP-CLP20-15-E	15 m
		JZSP-CLP20-20-E	20 m

・Dimensional Drawing



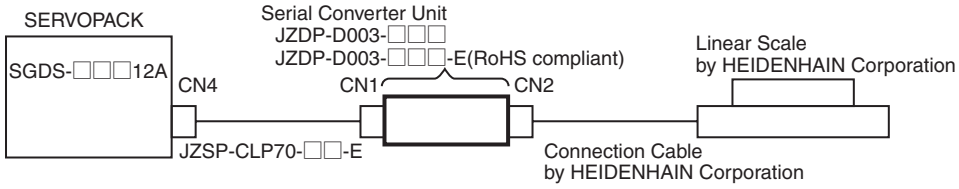
Serial Converter Units for Fully-closed Control

● Connection Examples

(1) Connection Example with Linear Scale by HEIDENHAIN Corporation

• Model: JZDP-D003-□□□

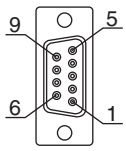
JZDP-D003-□□□-E(RoHS compliant)



Pin No.	Signal
1	+5 V
2	S-phase output
3	Not used
4	Not used
5	0 V
6	/S-phase output
7	Not used
8	Not used
9	Not used
Case	Shield

CN1

Serial Data Output
to SERVOPACK



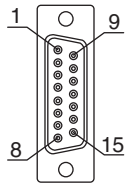
17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

[· RoHS compliant
17LE-13090-27-FA
(Socket)]

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0 V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

CN2

Analog Signal Input
to Linear scale



17-series Connector:
17LE-13150-27
(Socket) by DDK Ltd.

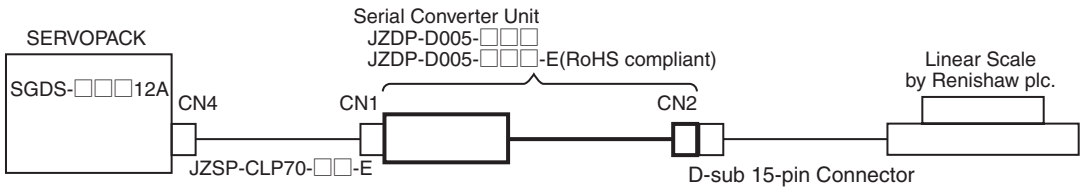
[· RoHS compliant
17LE-13150-27-FA
(Socket)]

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin) manufactured by HEIDENHAIN Corporation can be directly connected.

(2) Connection Example with Linear Scale by Renishaw plc.

• Model: JZDP-D005-□□□

JZDP-D005-□□□-E(RoHS compliant)

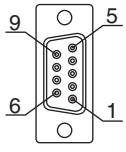


Pin No.	Signal
1	+5 V
2	S-phase output
3	Not used
4	Not used
5	0 V
6	/S-phase output
7	Not used
8	Not used
9	Not used
Case	Shield

SERVOPACK does not have
the function to process Vq
signals.

CN1

Serial Data Output
to SERVOPACK



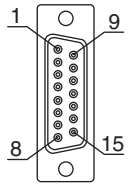
17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

[· RoHS compliant
17LE-13090-27-FA
(Socket)]

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner (0 V)
Case	Shield

CN2

Analog Signal Input
to Linear Scale



17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK Ltd.

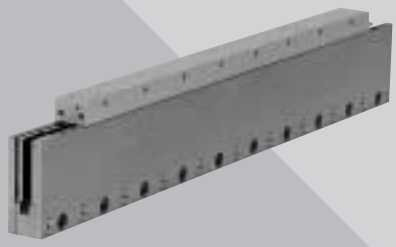
[· RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)]

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin) by Renishaw plc. can be directly connected. However, the BID and DIR signals are not connected.
3 Use the linear-scale connector to change the home position specifications of the linear scale.

Linear Servomotors

SGLGW

(Coreless)



Model Designation

●Moving Coil

SGL G W - 30 A 050 C P □

Linear Σ Series
Linear Servomotor

Servomotor Type

Code	Specifications
G	Coreless

W: Moving Coil

Magnet Height

Voltage
A: 200 VAC

Length of Moving Coil

Design Revision Order
A, B...

Connector for Main Circuit Cable

Code	Specifications	Applicable Model
Blank	Connector by Tyco Electronics AMP K.K.	All models
D	Connector by Interconnectron GmbH	SGLGW-30A, -40A, -60A

Hall Sensor/Cooling Method

Code	Specifications	Applicable Model
P	With hall sensor	All models
C	Forced cooling	SGLGW-40A, -60A, -90A
H	With hall sensor and forced cooling	
Blank	Without hall sensor	All models

●Magnetic Way

SGL G M - 30108 A □

Linear Σ Series
Linear Servomotor

Servomotor Type

Code	Specifications
G	Coreless

M: Magnetic Way

Magnet Height

Length of Magnetic Way

Options

Code	Specifications	Applicable Model
Blank	Standard	All models
-M	High force	SGLGM-40, -60

Design Revision Order
A, B...
Note: The coreless linear servomotor is available as revised model C (without mounting holes on the bottom) and as revised model CT (with mounting holes on the bottom).

Features

- Direct-feed mechanism for high-speed and high-precision positioning.
- Lack of magnetic attraction force helps ex tend the life of linear motion guides and minimiz es noise.
- Zero cogging for minimal velocity ripple.

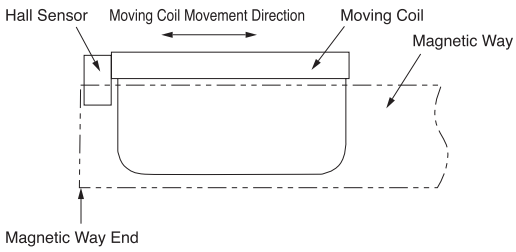
Application Examples

- Feeders and loaders
- Semiconductor equipment
- LCD manufacturing equipment

●Precautions on Moving Coil with Hall Sensor

When using a moving coil with a hall sensor, the magnetic way must completely cover the bottom of the hall sensor. Refer to the ex ample showing the correct installation.
When determining the length of the moving coil's stroke or the length of the magnetic way, consider the total length of the moving coil and the hall sensor unit. Refer to the following table.

<Correct>



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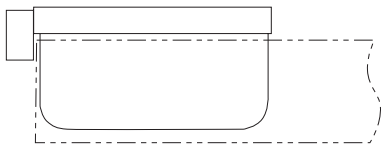
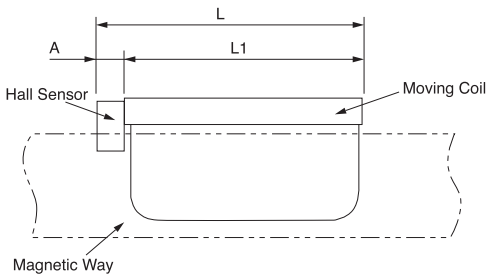


The total length of moving coil with hall sensor



Moving Coil Model SGLGW-	Length of Moving Coil L1(mm)	Length of Hall Sensor Unit A(mm)	Total Length L(mm)
30A050□P□	50	0 (Included in the length of Moving Coil)	50
30A080□P□	80		80
40A140□P□	140	16	156
40A253□P□	252.5		268.5
40A365□P□	365		381
60A140□P□	140	16	156
60A253□P□	252.5		268.5
60A365□P□	365		381
90A200□P□	199	0 (Included in the length of Moving Coil)	199
90A370□P□	367		367
90A535□P□	535		535

Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Protection Methods: Self-cooled, air-cooling
Ambient Humidity: 20 % to 80 % (no condensation)
Allowable Winding Temperature: 130℃ (Insulation class B)

● With Standard-force Magnetic Ways

Linear Servomotor Model SGLGW-		30A		40A			60A			90A		
		050C	080C	140C	253C	365C	140C	253C	365C	200C	370C	535C
Peak Speed*	m/s	5	5	5	5	5	4.8	4.8	4.8	4	4	4
Rated Force*	N	12.5	25	47	93	140	70	140	210	325	550	750
Rated Current*	Arms	0.51	0.79	0.8	1.6	2.4	1.2	2.2	3.3	4.4	7.5	10.2
Instantaneous Peak Force*	N	40	80	140	280	420	220	440	660	1300	2200	3000
Instantaneous Peak Current*	Arms	1.62	2.53	2.4	4.9	7.3	3.5	7.0	10.5	17.6	30.0	40.8
Moving Coil Mass	kg	0.10	0.15	0.34	0.60	0.87	0.42	0.76	1.10	2.15	3.6	4.9
Force Constant	N/Arms	26.4	33.9	61.5	61.5	61.5	66.6	66.6	66.6	78.0	78.0	78.0
BEMF Constant	V/(m/s)	8.8	11.3	20.5	20.5	20.5	22.2	22.2	22.2	26.0	26.0	26.0
Motor Constant	$N/\sqrt{W}$	3.7	5.6	7.8	11.0	13.5	11.1	15.7	19.2	26.0	36.8	45.0
Electrical Time Constant	ms	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.5	1.4	1.4	1.4
Mechanical Time Constant	ms	7.30	4.78	5.59	4.96	4.77	3.41	3.08	2.98	3.18	2.66	2.42
Thermal Resistance (With Heat Sink)	K/W	5.19	3.11	1.67	0.87	0.58	1.56	0.77	0.51	0.39	0.26	0.22
Thermal Resistance (Without Heat Sink)	K/W	8.13	6.32	3.02	1.80	1.23	2.59	1.48	1.15	1.09	0.63	0.47
Magnetic Attraction	N	0	0	0	0	0	0	0	0	0	0	0

Notes: 1 The items marked with an ✻ and "Force and Speed Characteristics" are the values at a motor winding temperature of 100℃ during operation in combination with a SERVOPACK. The others are at 20℃.
2 The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the moving coil.

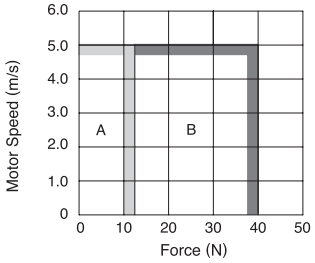
Linear Servomotor Model SGLGW-	Heat Sink Size in mm
30A050C 30A080C 40A140C 60A140C	200×300×12
40A253C 60A253C	300×400×12
40A365C 60A365C	400×500×12
90A200C 90A370C 90A535C	800×900×12

Ratings and Specifications

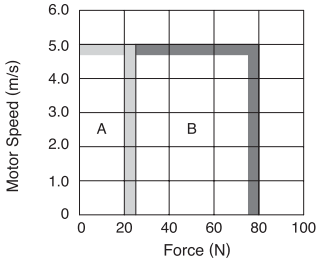
- Force and Speed Characteristics
(With Standard-force Magnetic Ways)

A Continuous duty zone B Intermittent duty zone

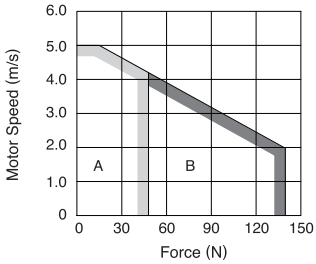
SGLGW-30A050C



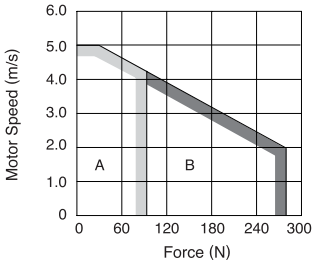
SGLGW-30A080C



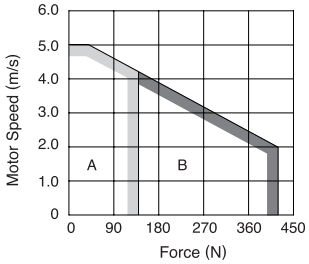
SGLGW-40A140C



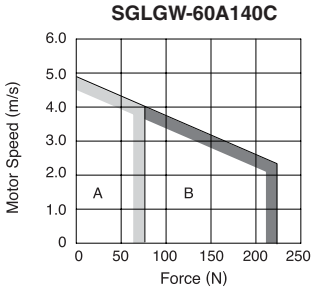
SGLGW-40A253C



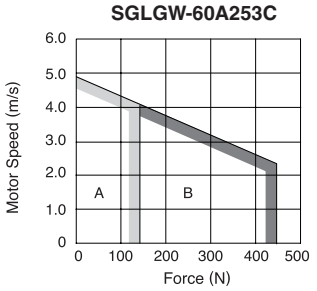
SGLGW-40A365C



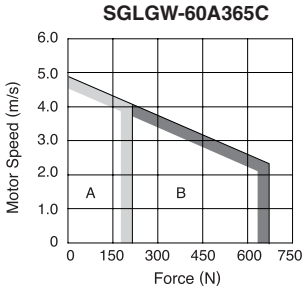
SGLGW-60A140C



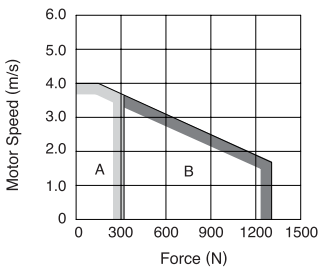
SGLGW-60A253C



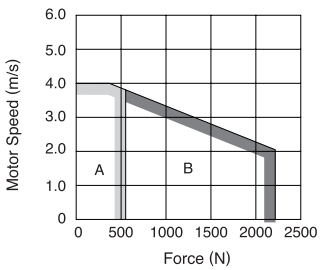
SGLGW-60A365C



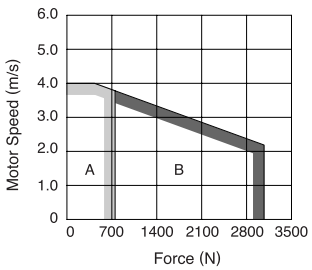
SGLGW-90A200C



SGLGW-90A370C



SGLGW-90A535C



● With High-force Magnetic Ways

Linear Servomotor Model SGLGM-□□□□□C-M + SGLGW-		40A			60A		
		140C	253C	365C	140C	253C	365C
Peak Speed*	m/s	4.2	4.2	4.2	4.2	4.2	4.2
Rated Force*	N	57	114	171	85	170	255
Rated Current*	Arms	0.8	1.6	2.4	1.2	2.2	3.3
Instantaneous Peak Force*	N	230	460	690	360	720	1080
Instantaneous Peak Current*	Arms	3.2	6.5	9.7	5.0	10.0	14.9
Moving Coil Mass	kg	0.34	0.60	0.87	0.42	0.76	1.10
Force Constant	N/Arms	76.0	76.0	76.0	77.4	77.4	77.4
BEMF Constant	V/(m/s)	25.3	25.3	25.3	25.8	25.8	25.8
Motor Constant	N/$\sqrt{W}$	9.6	13.6	16.7	12.9	18.2	22.3
Electrical Time Constant	ms	0.4	0.4	0.4	0.5	0.5	0.5
Mechanical Time Constant	ms	3.69	3.24	3.12	2.52	2.29	2.21
Thermal Resistance (With Heat Sink)	K/W	1.67	0.87	0.58	1.56	0.77	0.51
Thermal Resistance (Without Heat Sink)	K/W	3.02	1.80	1.23	2.59	1.48	1.15
Magnetic Attraction	N	0	0	0	0	0	0

Notes: 1 The items marked with an ✻ and "Force and Speed Characteristics" are the values at a motor winding temperature of 100°C during operation in combination with a SERVOPACK. The others are at 20°C.

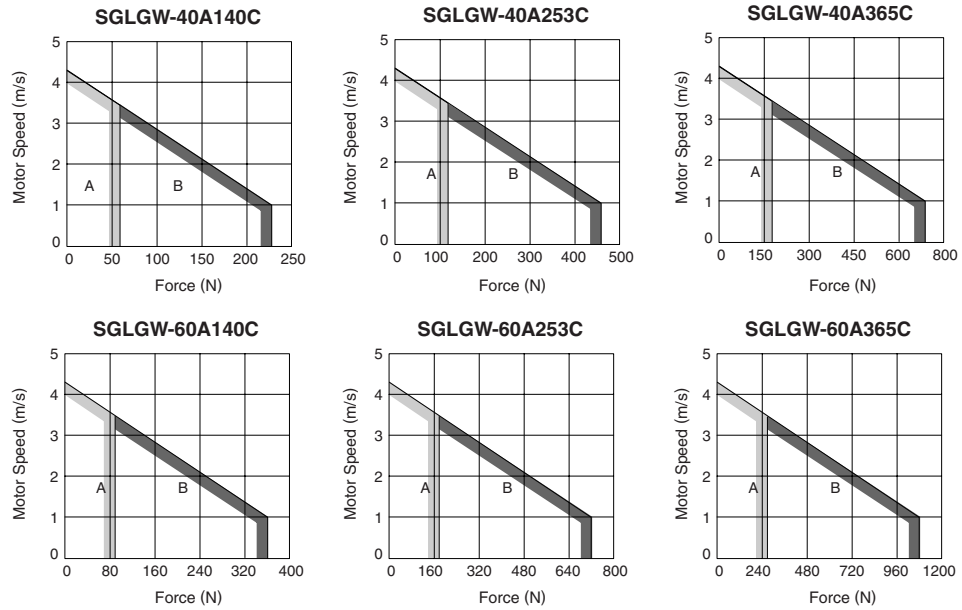
2 The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the moving coil.

Linear Servomotor Model SGLGW-	Heat Sink Size in mm
40A140C 60A140C	200×300×12
40A253C 60A253C	300×400×12
40A365C 60A365C	400×500×12

Ratings and Specifications

- Force and Speed Characteristics (With High-force Magnetic Ways)

A Continuous duty zone B Intermittent duty zone



- Mechanical Specifications

(1) Impact Resistance

・Impact acceleration: 196 m/s^2

・Impact occurrences: twice

(2) Vibration Resistance

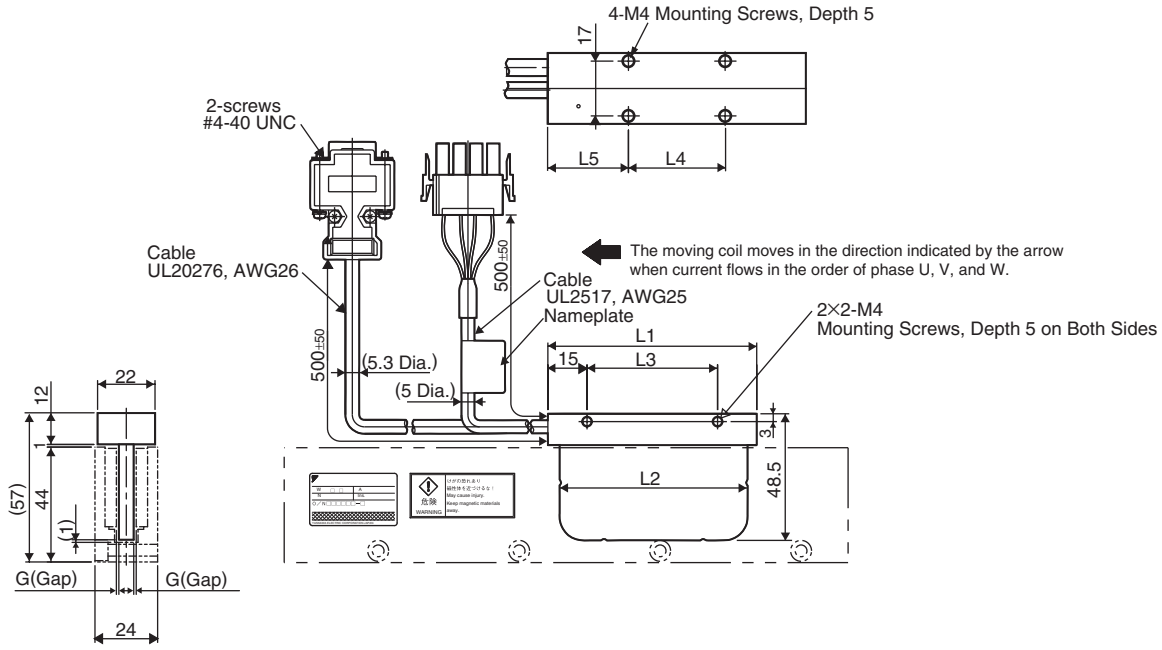
The linear servomotors will withstand the following vibration acceleration in three directions: Vertical, side to side, and front to back

・Vibration acceleration: 49 m/s^2

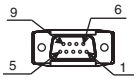
External Dimensions Units: mm

- SGLG□-30 Linear Servomotors

(1) Moving Coil: SGLGW-30A□□□C□ (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor
Connector Specifications



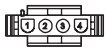
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector :
17JE-13090-02 (D8C)
Stud: 17L-002C or 17L-002C1

Pin No	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications



Plug : 350779-1
Pin : 350924-1 or
770672-1
by Tyco Electronics AMP K.K.

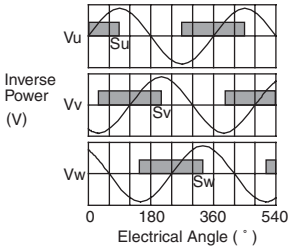
The Mating Connector

Cap : 350780-1
Socket : 350925-1 or
770673-1

Pin No	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the following figure.

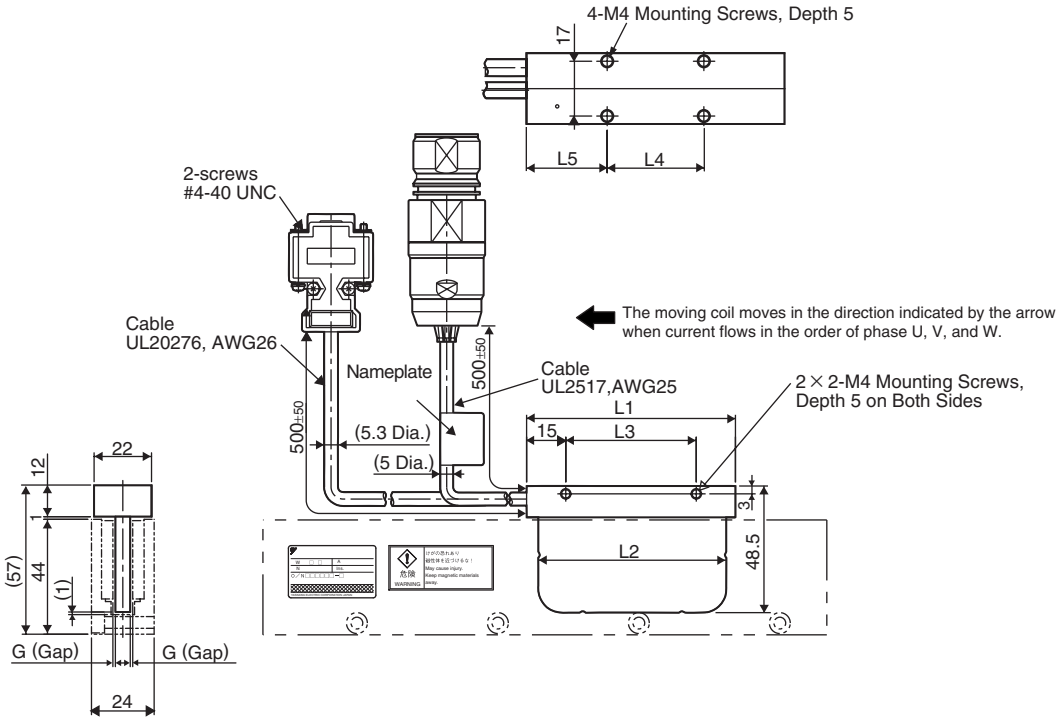


Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	G (Gap)	Approx. Mass* kg
30A050C□	50	48	30	20	20	0.85	0.14
30A080C□	80	72	50	30	25	0.95	0.19

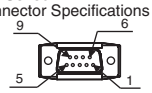
*:The value indicates the mass of moving coil with a hall sensor unit.

External Dimensions Units: mm

(2) Moving Coil: SGLGW-30A□□□C□D (With a connector by Interconnectron GmbH)



Hall Sensor
Connector Specifications



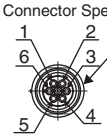
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector : 17JE-13090-02 (D8C)
Stud: 17L-002C or 17L-002C1

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications



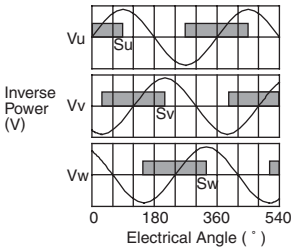
Extension : SROC06JMSCN169
Pin : 021.423.1020
by Interconnectron GmbH
The Mating Connector

Plug : SPUC06KFSDN236
Socket : 020.030.1020

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	–
5	Not used	–
6	FG	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the following figure.



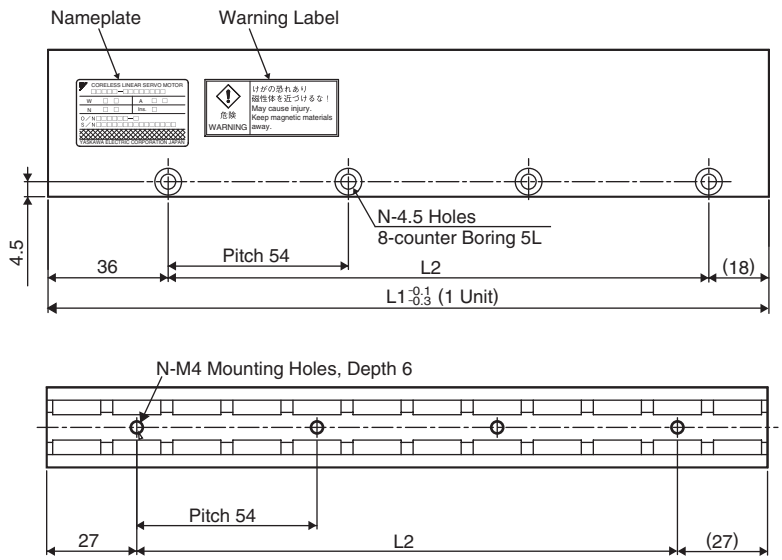
Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	G (Gap)	Approx. Mass* kg
30A050C□D	50	48	30	20	20	0.85	0.14
30A080C□D	80	72	50	30	25	0.95	0.19

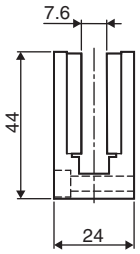
*:The value indicates the mass of moving coil with a hall sensor unit.

External Dimensions Units: mm

- SGLG□-30 Linear Servomotors

(3) Magnetic Way: SGLGM-30□□□A





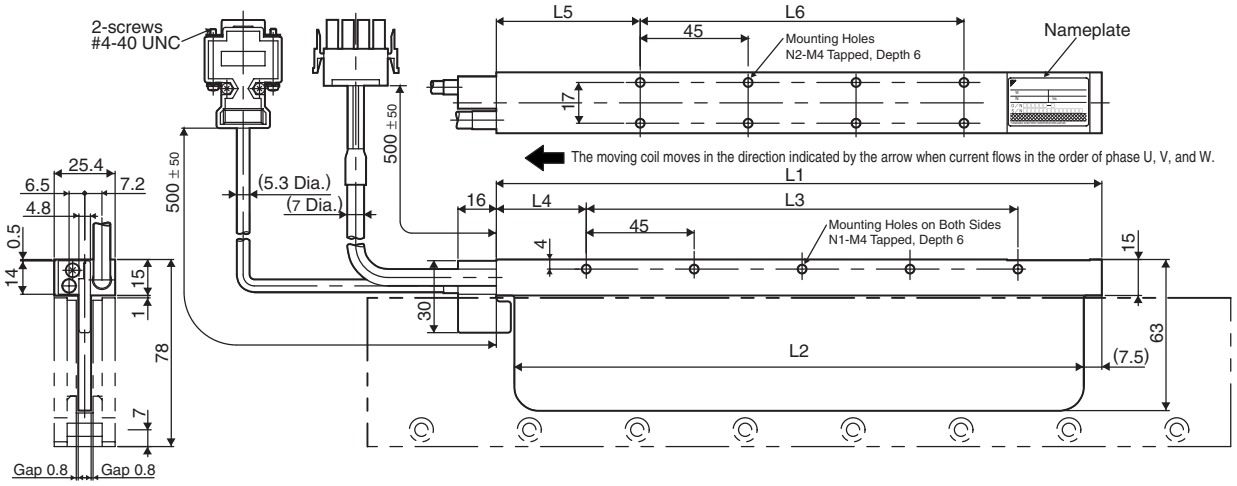
Note: If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLGM-	L1	L2	N	Approx. Mass kg
30108A	108	54	2	0.6
30216A	216	162	4	1.1
30432A	432	378	8	2.3

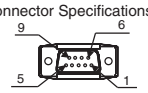
External Dimensions Units: mm

- SGLG□-40 Linear Servomotors

(1) Moving Coil: SGLGW-40A□□□C□ (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor
Connector Specifications



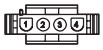
Pin Connector :
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector :	17JE-13090-02 (D8C)
Stud:	17L-002C or 17L-002C1

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications



Plug : 350779-1
Pin : 350561-3 or
350690-3 (No.1 to 3)
350654-1
350669-1 (No.4)
by Tyco Electronics AMP K.K.

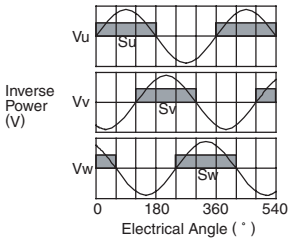
The Mating Connector

Cap	: 350780-1
Socket	: 350570-3 or 350689-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



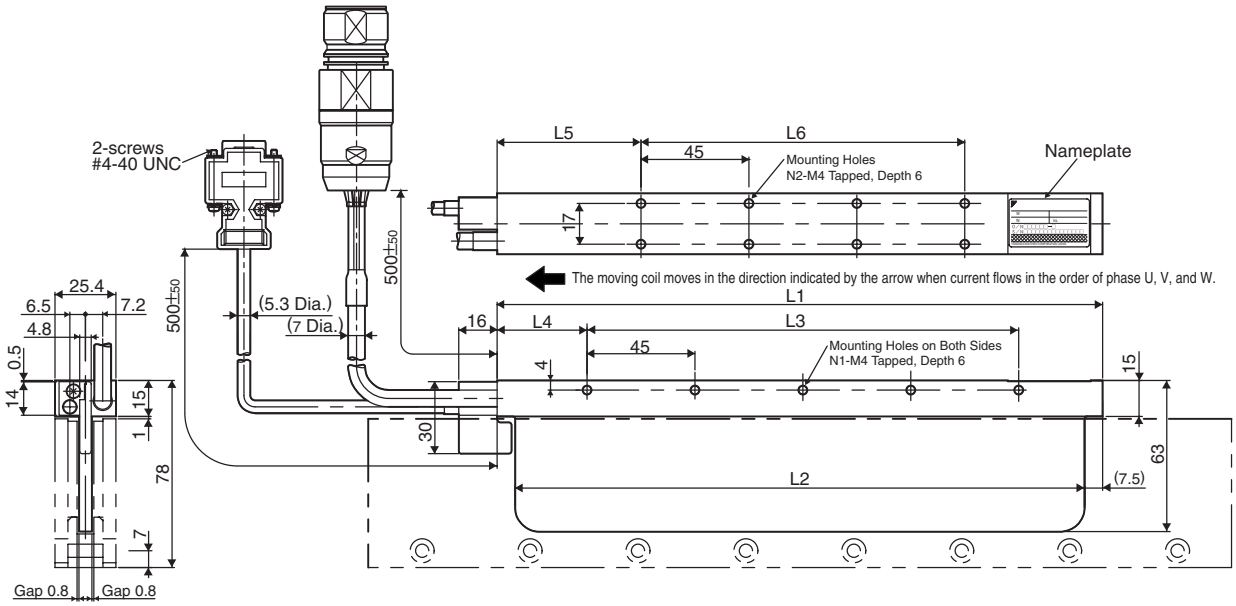
Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* kg
40A140C□	140	125	90	30	52.5	45	3	4	0.40
40A253C□	252.5	237.5	180	37.5	60	135	5	8	0.66
40A365C□	365	350	315	30	52.5	270	8	14	0.93

*:The value indicates the mass of moving coil with a hall sensor unit.

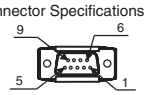
External Dimensions Units: mm

- SGLG□-40 Linear Servomotors

(2) Moving Coil: SGLGW-40A□□□C□D (With a connector by Interconnectron GmbH)



Hall Sensor
Connector Specifications



Pin Connector :
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector :	17JE-13090-02 (D8C)
Stud:	17L-002C or 17L-002C1

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications

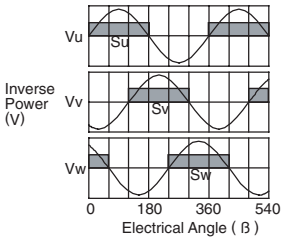
Extension : SROC06JMSCN169
Pin : 021.423.1020
by Interconnectron GmbH
The Mating Connector

Plug	: SPUC06KFSDN236
Socket	: 020.030.1020

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	–
5	Not used	–
6	FG	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



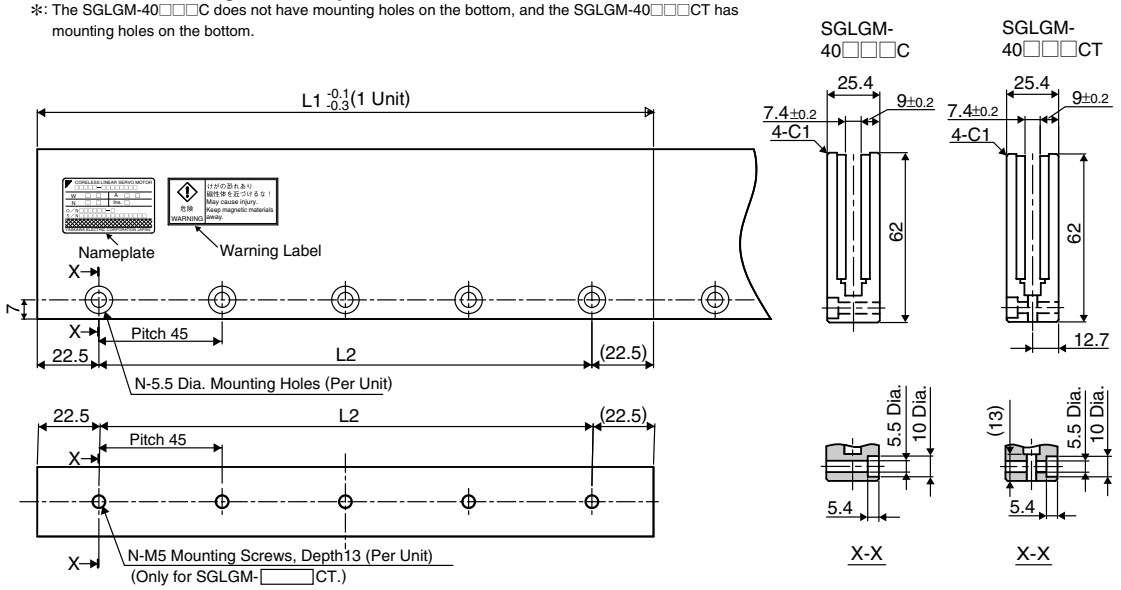
Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* kg
40A140C□D	140	125	90	30	52.5	45	3	4	0.40
40A253C□D	252.5	237.5	180	37.5	60	135	5	8	0.66
40A365C□D	365	350	315	30	52.5	270	8	14	0.93

*:The value indicates the mass of moving coil with a hall sensor unit.

External Dimensions Units: mm

(3) Standard-force Magnetic Way: SGLGM-40□□□C/SGLGM-40□□□CT*

*: The SGLGM-40□□□C does not have mounting holes on the bottom, and the SGLGM-40□□□CT has mounting holes on the bottom.

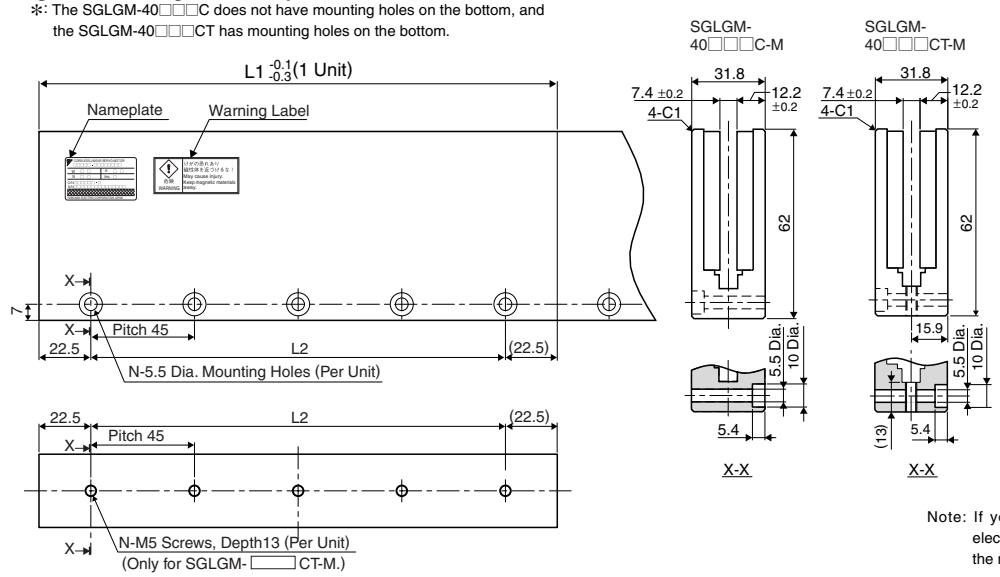


Note: If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Type	Standard-force Magnetic Way Model SGLGM-	L1	L2	N	Approx. Mass kg
Standard Force	40090C or 40090CT	90	45	2	0.8
	40225C or 40225CT	225	180	5	2.0
	40360C or 40360CT	360	315	8	3.1
	40405C or 40405CT	405	360	9	3.5
	40450C or 40450CT	450	405	10	3.9

(4) High-force Magnetic Way: SGLGM-40□□□C-M/SGLGM-40□□□CT-M*

*: The SGLGM-40□□□C does not have mounting holes on the bottom, and the SGLGM-40□□□CT has mounting holes on the bottom.



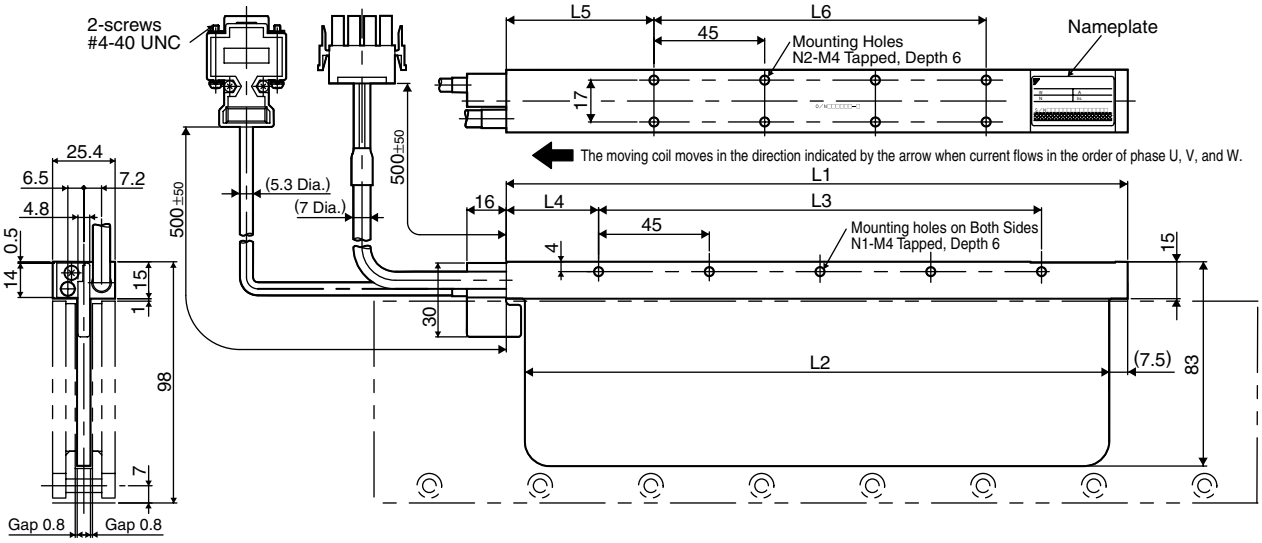
Note: If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Type	High-force Magnetic Way Model SGLGM-	L1	L2	N	Approx. Mass kg
High Force	40090C-M or 40090CT-M	90	45	2	1.0
	40225C-M or 40225CT-M	225	180	5	2.6
	40360C-M or 40360CT-M	360	315	8	4.1
	40405C-M or 40405CT-M	405	360	9	4.6
	40450C-M or 40450CT-M	450	405	10	5.1

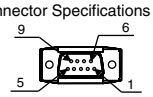
External Dimensions Units: mm

- SGLG□-60 Linear Servomotors

(1) Moving Coil: SGLGW-60A□□□C□ (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor
Connector Specifications



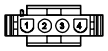
Pin Connector :
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector :	17JE-13090-02 (D8C)
Stud:	17L-002C or 17L-002C1

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications



Plug : 350779-1
Pin : 350561-3 or
350690-3 (No.1 to 3)
350654-1
350669-1 (No.4)
by Tyco Electronics AMP K.K.

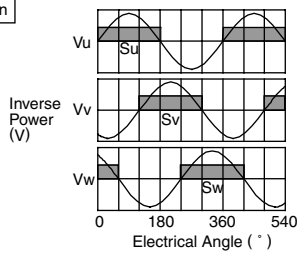
The Mating Connector

Cap	: 350780-1
Socket	: 350570-3 or 350689-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.

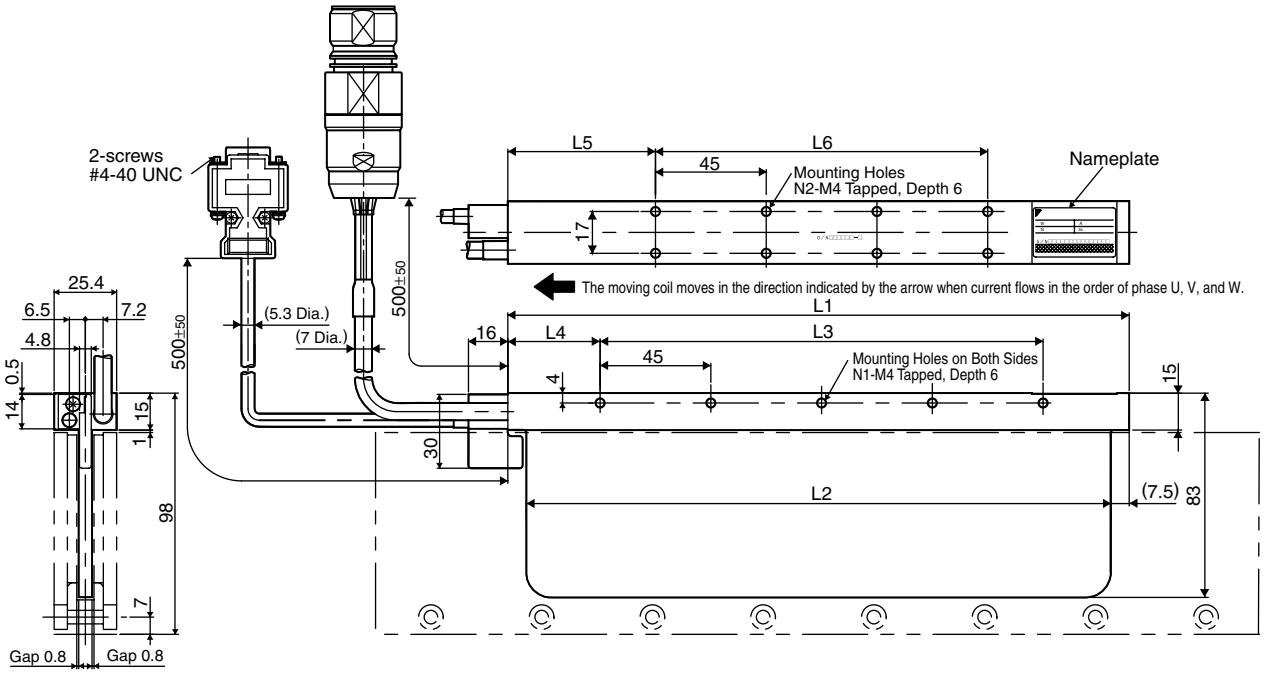


Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* kg
60A140C□	140	125	90	30	52.5	45	3	4	0.48
60A253C□	252.5	237.5	180	37.5	60	135	5	8	0.82
60A365C□	365	350	315	30	52.5	270	8	14	1.16

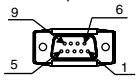
*:The value indicates the mass of moving coil with a hall sensor unit.

External Dimensions Units: mm

(2) Moving Coil: SGLGW-60A□□□C□D (With a connector by Interconnectron GmbH)



Hall Sensor
Connector Specifications

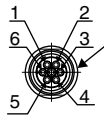


Pin Connector :
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector
Socket Connector :
17JE-13090-02 (D8C)
Stud: 17L-002C or 17L-002C1

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications

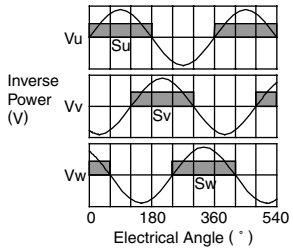


Extension : SROC06JMSCN169
Pin : 021.423.1020
by Interconnectron GmbH
The Mating Connector
Plug : SPUC06KFSDN236
Socket : 020.030.1020

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	Not used	–
5	Not used	–
6	FG	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* kg
60A140C□D	140	125	90	30	52.5	45	3	4	0.48
60A253C□D	252.5	237.5	180	37.5	60	135	5	8	0.82
60A365C□D	365	350	315	30	52.5	270	8	14	1.16

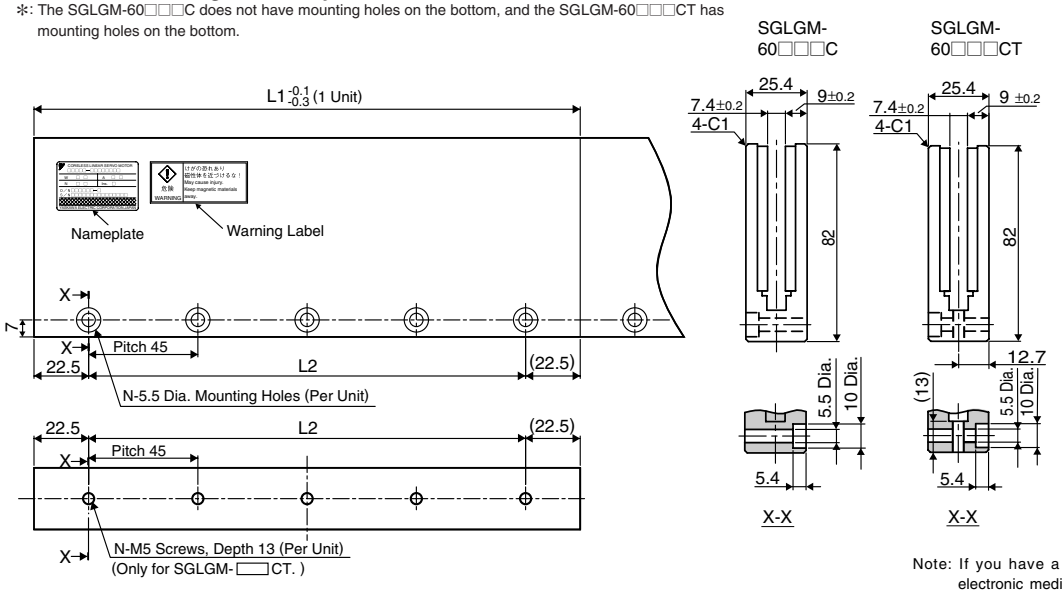
*:The value indicates the mass of moving coil with a hall sensor unit.

External Dimensions Units: mm

• SGLG□-60 Linear Servomotors

(3) Standard-force Magnetic Way: SGLGM-60□□□C/SGLGM-60□□□CT*

*: The SGLGM-60□□□C does not have mounting holes on the bottom, and the SGLGM-60□□□CT has mounting holes on the bottom.

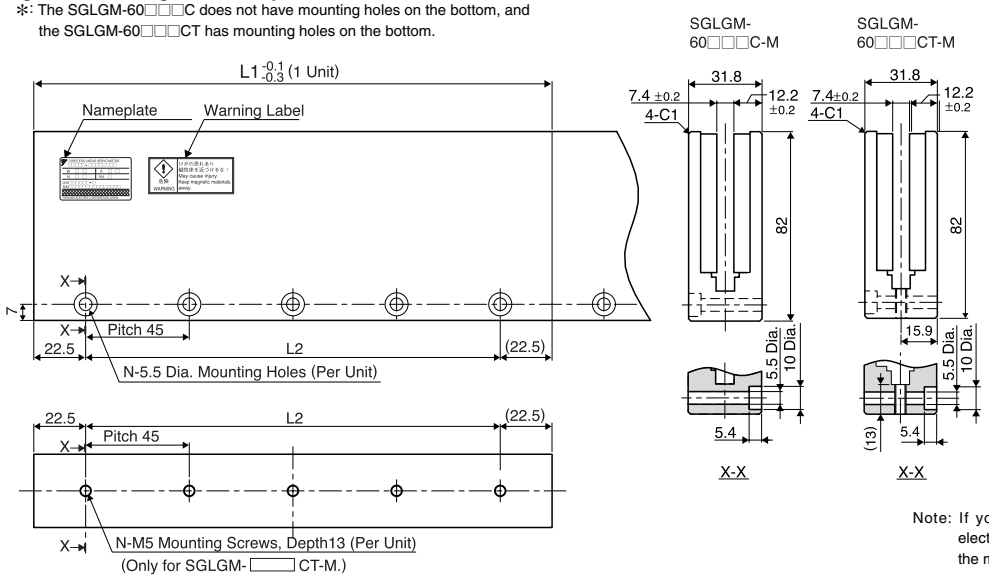


Note: If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

type	Standard-force Magnetic Way Model SGLGM-	L1	L2	N	Approx. Mass kg
Standard Force	60090C or 60090CT	90	45	2	1.1
	60225C or 60225CT	225	180	5	2.6
	60360C or 60360CT	360	315	8	4.1
	60405C or 60405CT	405	360	9	4.6
	60450C or 60450CT	450	405	10	5.1

(4) High-force Magnetic Way: SGLGM-60□□□C-M/SGLGM-60□□□CT-M*

*: The SGLGM-60□□□C does not have mounting holes on the bottom, and the SGLGM-60□□□CT has mounting holes on the bottom.



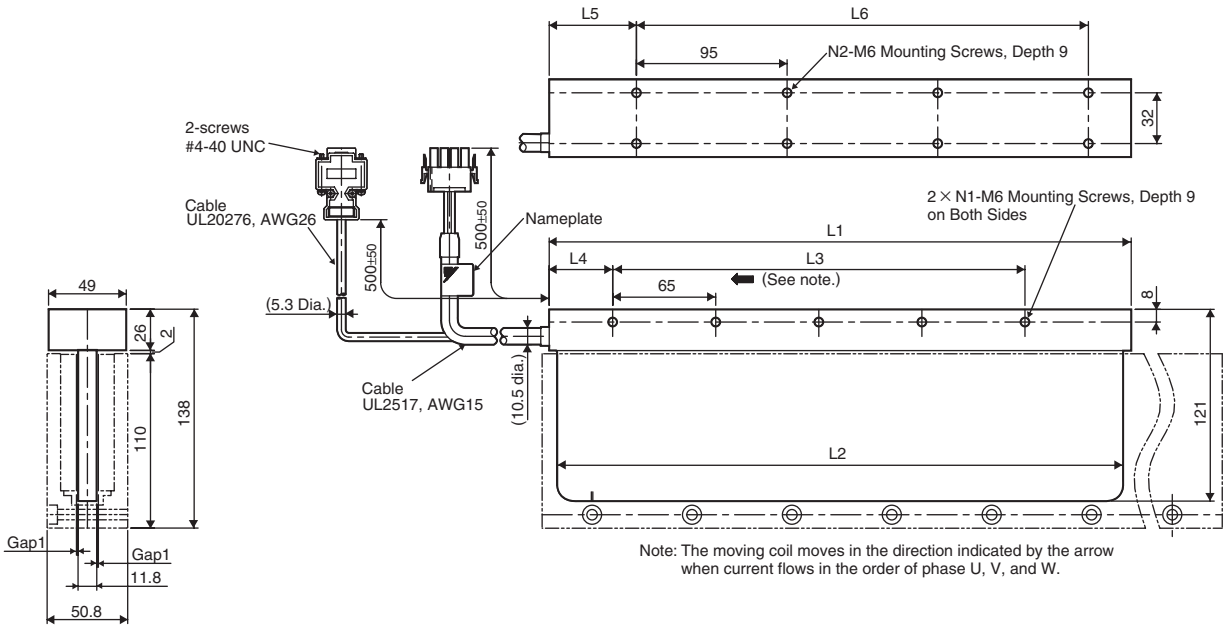
Note: If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Type	High-force Magnetic Way Model SGLGM-	L1	L2	N	Approx. Mass kg
High Force	60090C-M or 60090CT-M	90	45	2	1.3
	60225C-M or 60225CT-M	225	180	5	3.3
	60360C-M or 60360CT-M	360	315	8	5.2
	60405C-M or 60405CT-M	405	360	9	5.9
	60450C-M or 60450CT-M	450	405	10	6.6

External Dimensions Units: mm

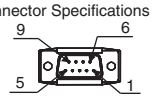
- SGLG□-90 Linear Servomotors

(1) Moving Coil: SGLGW-90A□□□C□ (With a connector by Tyco Electronics AMP K.K.)



Note: The moving coil moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

Hall Sensor Connector Specifications



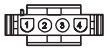
Pin Connector :
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector :
17JE-13090-02 (D8C)
Stud: 17L-002C or 17L-002C1

Pin No.	Name
1	+5 V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug : 350779-1
Pin : 350218-3 or
350547-3 (No.1 to 3)
350654-1
350669-1 (No.4)
by Tyco Electronics AMP K.K.

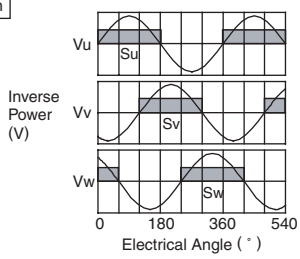
The Mating Connector

Cap : 350780-1
Socket : 350536-3 or
350550-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



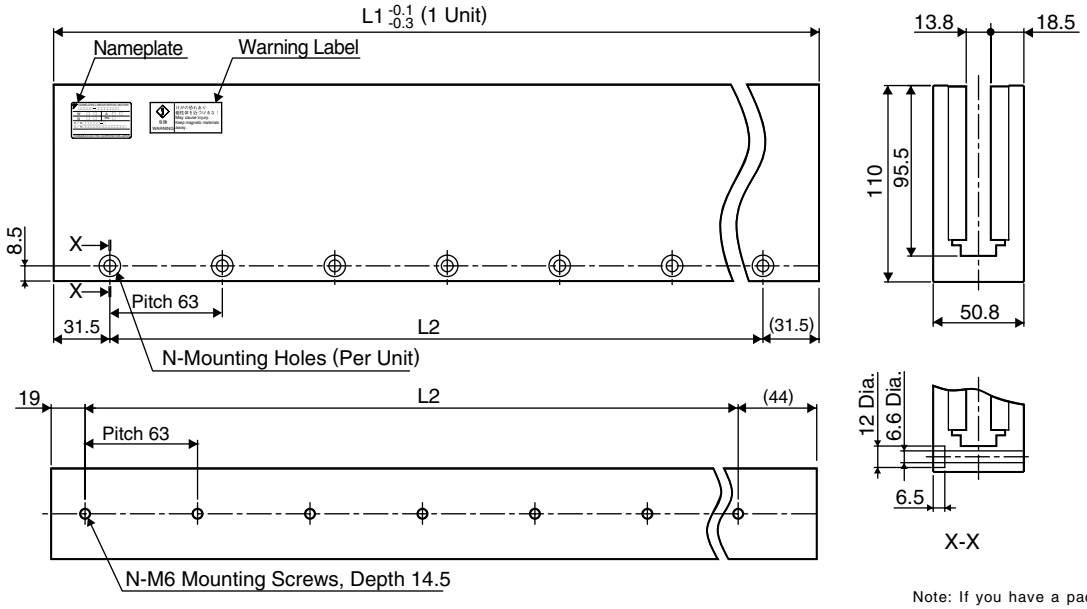
Moving Coil Model SGLGW-	L1	L2	L3	L4	L5	L6	N1	N2	Approx. Mass* kg
90A200C□	199	189	130	40	60	95	3	4	2.2
90A370C□	367	357	260	40	55	285	5	8	3.65
90A535C□	535	525	455	40	60	380	8	10	4.95

*:The value indicates the mass of moving coil with a hall sensor unit.

External Dimensions Units: mm

- SGLG□-90 Linear Servomotors

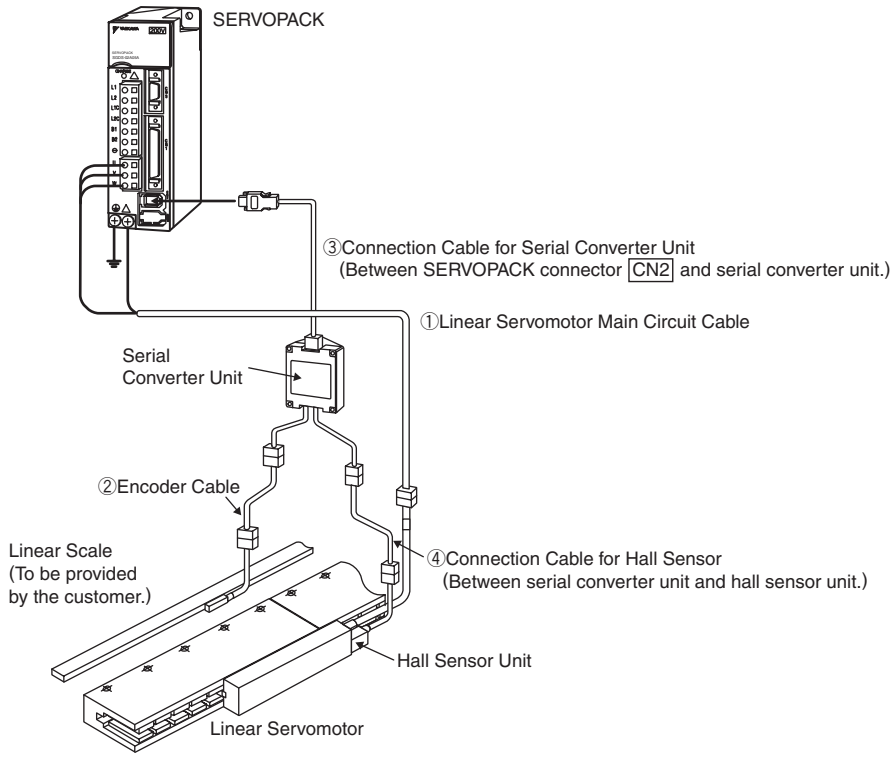
(2) Magnetic Way: SGLGM-90□□□A

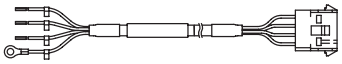
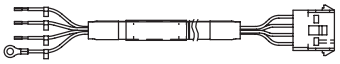
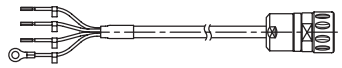


Note: If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLGM-	L1	L2	N	Approx. Mass kg
90252A	252	189	4	7.3
90504A	504	441	8	14.7

Selecting Cables

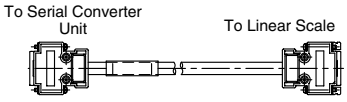
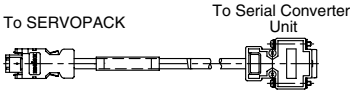
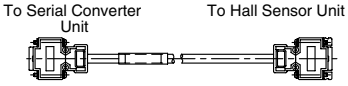


Name	Applicable Linear Servomotor Model	Length	Order No.	Specifications	Details
① Linear Servomotor Main Circuit Cables	SGLGW -30,-40,-60	1 m	JZSP-CLN11-01-E	To SERVOPACK To Linear Servomotor  ∗1	(1)
		3 m	JZSP-CLN11-03-E		
		5 m	JZSP-CLN11-05-E		
		10 m	JZSP-CLN11-10-E		
		15 m	JZSP-CLN11-15-E		
		20 m	JZSP-CLN11-20-E		
	SGLGW-90	1 m	JZSP-CLN21-01-E	To SERVOPACK To Linear Servomoto  ∗1	(2)
		3 m	JZSP-CLN21-03-E		
		5 m	JZSP-CLN21-05-E		
		10 m	JZSP-CLN21-10-E		
		15 m	JZSP-CLN21-15-E		
		20 m	JZSP-CLN21-20-E		
	SGLGW -30□□□□□□D -40□□□□□□D -60□□□□□□D	1 m	JZSP-CLN14-01-E	To SERVOPACK To Linear Servomotor  ∗2	(3)
		3 m	JZSP-CLN14-03-E		
		5 m	JZSP-CLN14-05-E		
		10 m	JZSP-CLN14-10-E		
		15 m	JZSP-CLN14-15-E		
		20 m	JZSP-CLN14-20-E		

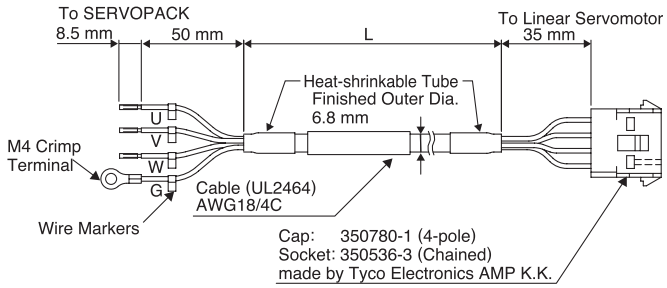
∗1: Connector by Tyco Electronics AMP K.K.
∗2: Connector by Interconnectron GmbH

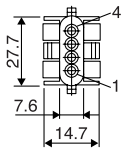
(Cont'd)

Selecting Cables

Name	Applicable Linear Servomotor Model	Length	Order No.	Specifications	Details
② Encoder Cables	All models	1 m	JZSP-CLL00-01-E		(4)
		3 m	JZSP-CLL00-03-E		
		5 m	JZSP-CLL00-05-E		
		10 m	JZSP-CLL00-10-E		
		15 m	JZSP-CLL00-15-E		
③ Connection Cables for Serial Converter Unit	All models	1 m	JZSP-CLP70-01-E		(5)
		3 m	JZSP-CLP70-03-E		
		5 m	JZSP-CLP70-05-E		
		10 m	JZSP-CLP70-10-E		
		15 m	JZSP-CLP70-15-E		
		20 m	JZSP-CLP70-20-E		
④ Connection Cables for Hall Sensor	All models	1 m	JZSP-CLL10-01-E		(6)
		3 m	JZSP-CLL10-03-E		
		5 m	JZSP-CLL10-05-E		
		10 m	JZSP-CLL10-10-E		
		15 m	JZSP-CLL10-15-E		

(1) Linear Servomotor Main Circuit Cable : JZSP-CLN11-□□-E





· Wiring Specifications

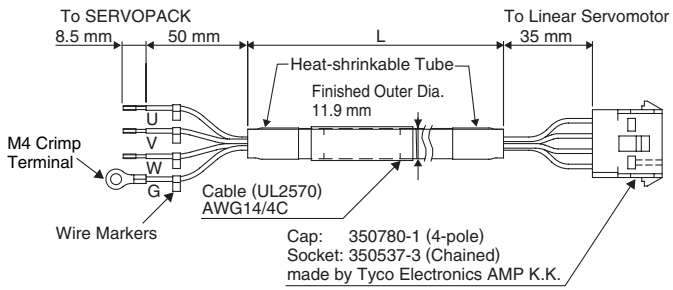
Leads to SERVOPACK

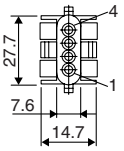
Wire Color	Signal
Red	Phase U
White	Phase V
Blue	Phase W
Green/Yellow	FG

Connector to Linear Servomotor

Signal	Pin No.
Phase U	1
Phase V	2
Phase W	3
FG	4

(2) Linear Servomotor Main Circuit Cable : JZSP-CLN21-□□-E





· Wiring Specifications

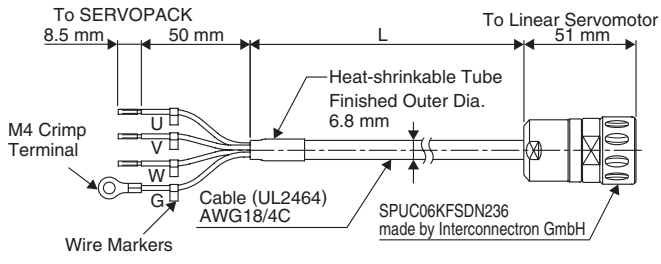
Leads to SERVOPACK

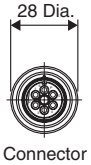
Wire Color	Signal
Red	Phase U
White	Phase V
Blue	Phase W
Green/Yellow	FG

Connector to Linear Servomotor

Signal	Pin No.
Phase U	1
Phase V	2
Phase W	3
FG	4

(3) Linear Servomotor Main Circuit Cable : JZSP-CLN14-□□-E





· Wiring Specifications

Leads to SERVOPACK

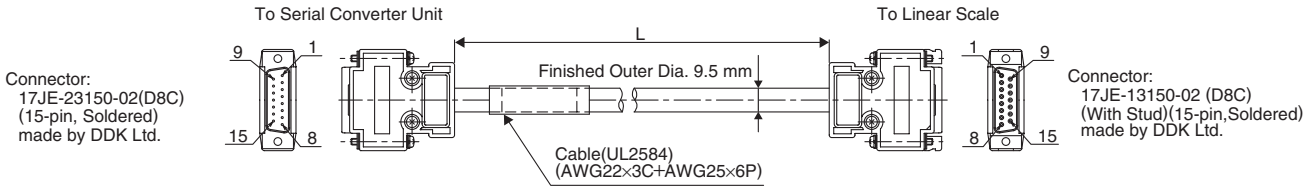
Wire Color	Signal
Black (White 1)	Phase U
Black (White 2)	Phase V
Black (White 3)	Phase W
Green / Yellow	FG

Connector to Linear Servomotor

Signal	Pin No.
Phase U	1
Phase V	2
Phase W	3
–	4
–	5
FG	6

Selecting Cables

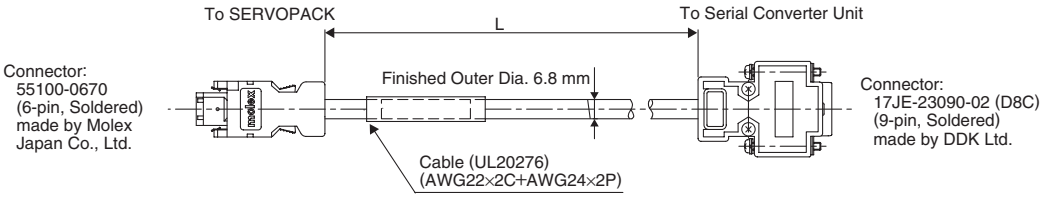
(4) Encoder Cable : JZSP-CLL00-□□-E



・Wiring Specifications

To Serial Converter Unit		To Linear Scale	
Pin No	Signal	Pin No.	Signal
1	/Cos (V1–)	1	/Cos (V1–)
2	/Sin (V2–)	2	/Sin (V2–)
3	Ref (V0+)	3	Ref (V0+)
4	+5 V	4	+5 V
5	5 Vs	5	5 Vs
6	BID	6	BID
7	Vx	7	Vx
8	Vq	8	Vq
9	Cos (V1+)	9	Cos (V1+)
10	Sin (V2+)	10	Sin (V2+)
11	/Ref (V0–)	11	/Ref (V0–)
12	0 V	12	0 V
13	0 Vs	13	0 Vs
14	DIR	14	DIR
15	Inner	15	Inner
Case	Shield	Case	Shield

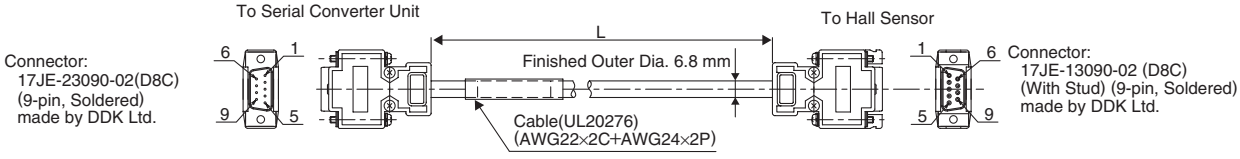
(5) Connection Cable for Serial Converter Unit : JZSP-CLP70-□□-E



・Wiring Specifications

To SERVOPACK			To Serial Converter Unit		
Pin No.	Signal	Lead Color	Pin No.	Signal	Lead Color
1	PG5 V	Red	1	+5 V	Red
2	PG0 V	Black	5	0 V	Black
3	–	–	3	–	–
4	–	–	4	–	–
5	PS	Light blue	2	Phase S output	Light blue
6	/PS	Light blue/white	6	Phase /S output	Light blue/white
Shell	Shield	–	Case	Shield	–
			7	–	–
			8	–	–
			9	–	–

(6) Connection Cable for Hall Sensor : JZSP-CLL10-□□-E



・Wiring Specifications

To Serial Converter Unit		To Hall Sensor	
Pin No.	Signal	Pin No.	Signal
1	+5 V	1	+5 V
2	Phase U input	2	Phase U input
3	Phase V input	3	Phase V input
4	Phase W input	4	Phase W input
5	0 V	5	0 V
6	–	6	–
7	–	7	–
8	–	8	–
9	–	9	–
Case	Shield	Case	Shield

Serial Converter Unit

● Characteristics and Specifications

	Items	Specifications
Electrical Characteristics	Power Supply Voltage	+5.0 V±5%, ripple content 5% max.
	Current Consumption*1	120 mA typ. 350 mA max.
	Signal Resolution	Input 2-phase sine wave: 1/256 pitch
	Max. Response Frequency	250 kHz
	Analog Input Signals*2 (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V
	Hall Sensor Input Signal	CMOS level
	Output Signals*3	Position data, hall sensor information, and alarms
	Output Method	Serial data transmission [HDLC (High-level Data Link Control) protocol format with Manchester codes]
	Transmission Cycle	62.5 μs
	Output Circuit	Balanced transceiver (SN75LBC176 or the equivalent) Internal terminal resistance: 120Ω
Mechanical Characteristics	Approx. Mass	150 g
	Vibration Resistance	98 m/s^2 max. (10 Hz to 2500 Hz) in three directions
	Shock Resistance	980 m/s^2, (11 ms) two times in three directions
Environmental Conditions	Operating Temperature	0˚C to 55˚C
	Storage Temperature	−20˚C to +80˚C
	Humidity	20% to 90% RH (no condensation)

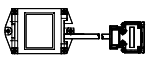
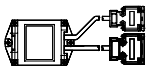
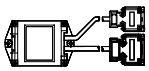
*1: The current consumption of the linear scale and hall sensor is not included in this value.
The current consumption of linear scale and hall sensor must be taken into consideration for the current capacity of host controller that supplies the power. The current consumption of hall sensor: Approx. 40 mA.

*2: Input a value within the specified range. Otherwise, incorrect position information is output, and the device may be damaged.

*3: The power is turned on, and the transmission is enabled after 100 ms to 300ms.

● Model Designation

JZDP - D003 - 001 - E

Serial Converter Unit Model			
Symbol	Appearance	Applicable Linear Scale	Hall Sensor
D003		Made by HEIDENHAIN Corp.	None
D005		Made by Renishaw plc.	None
D006		Made by HEIDENHAIN Corp.	Provided
D008		Made by Renishaw plc.	Provided

Applicable Linear Servomotor		
Servomotor Model		Symbol
SGLGW- (Coreless) When a standard-force magnetic way is used.	30A050C	250
	30A080C	251
	40A140C	252
	40A253C	253
	40A365C	254
	60A140C	258
	60A253C	259
	60A365C	260
	90A200C	264
	90A370C	265
	90A535C	266
SGLGW- + SGLGM-□□□-M (Coreless) When a high-force magnetic way is used.	40A140C	255
	40A253C	256
	40A365C	257
	60A140C	261
	60A253C	262
	60A365C	263

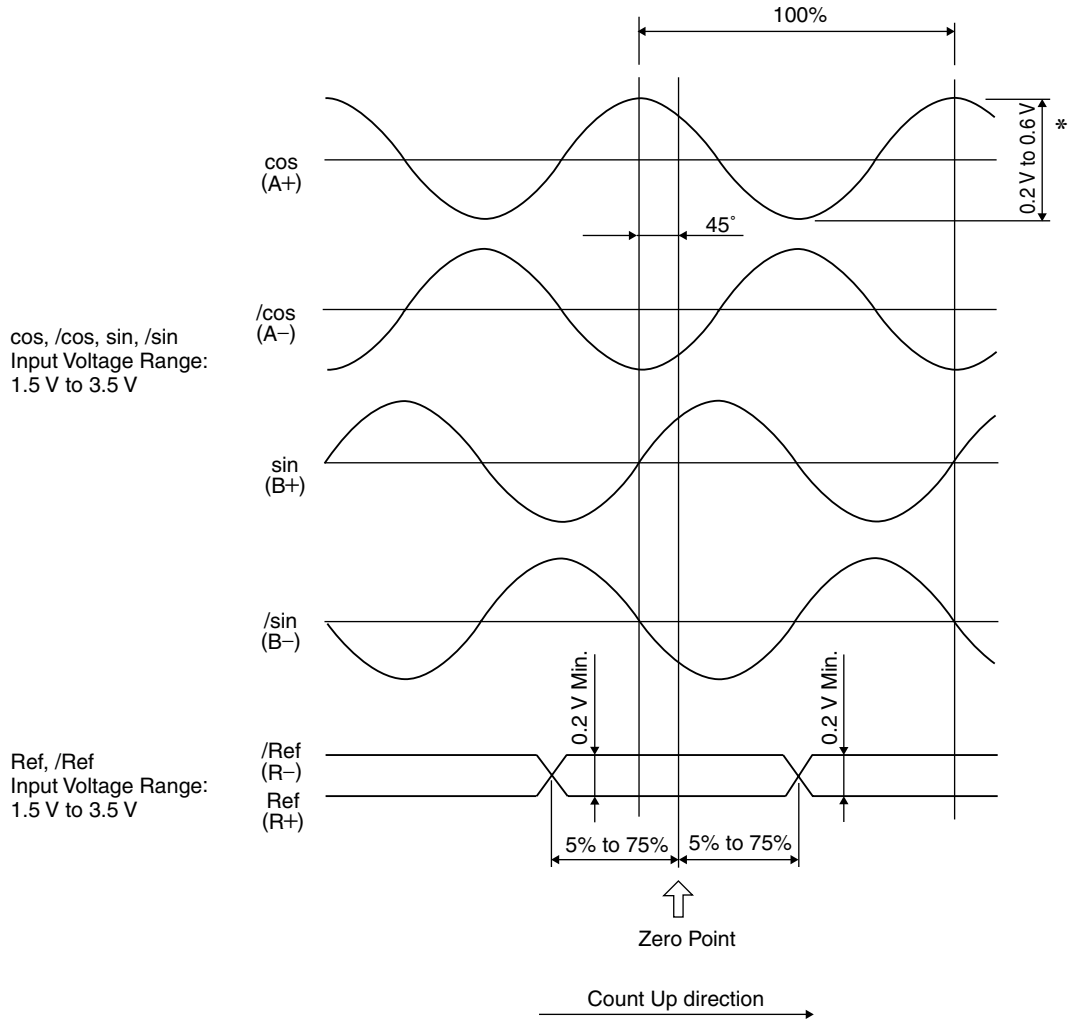
Code	Specifications
None	Not RoHS compliant
E	RoHS compliant

Note: Using the serial converter unit JZDP-A□□□ with SGDS SERVOPACK will void our guarantee.

Serial Converter Unit

● Analog Signal Input Timing

The following figure shows the input timing of the analog signals.
When the cos and sin signals are shifted 180 degrees, the differential signals are the /cos and /sin signals.
The specifications of the cos, /cos, sin, and /sin signals are identical except for the phase.
Input the signals Ref and /Ref so that they shall cross each other as shown in the figure because they are input into the converter. When they are crossed, the output data will be counted up.



*:If the analog signal amplitude declines to about 0.35 V because of differential amplitude, the serial converter outputs an alarm.

IMPORTANT

■Precautions

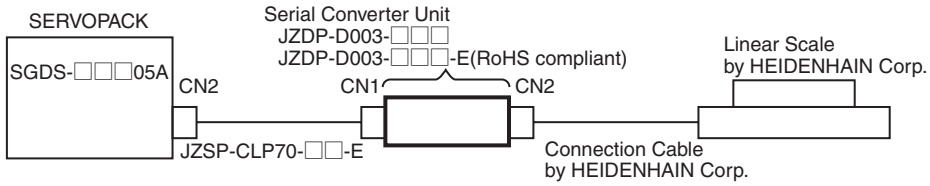
1 Never perform insulation resistance and withstand voltage tests.
2 When analog signals are input to the serial converter unit, noise influence on the analog signals affects the unit's ability to output correct position information. The analog cable must be as short as possible and shielded.
3 Use the serial converter unit in an environment without gases such as H_2S.
4 Do not connect or disconnect the unit while power is being supplied, or the unit may be damaged.
5 When using multiple axes, use a shield cable for each axis. Do not use a shield cable for multiple axes.

Serial Converter Unit Units: mm

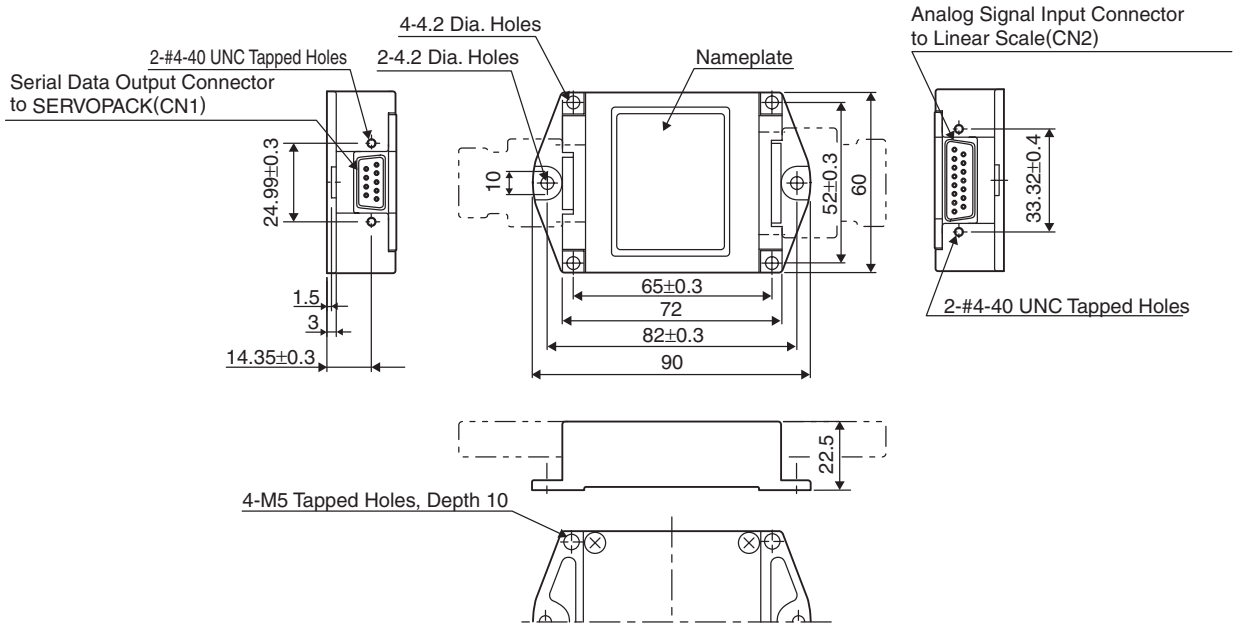
- Without Cable for Hall Sensor (For Linear Scale Manufactured by HEIDENHAIN Corporation)

Serial Converter: JZDP-D003-□□□
JZDP-D003-□□□-E(RoHS compliant)

(1) Connection Example

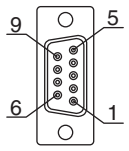


(2) External Dimensions



Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN1
Serial Data Output
to SERVOPACK

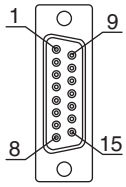


17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0 V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale



17-series Connector:
17LE-13150-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13150-27-FA
(Socket)

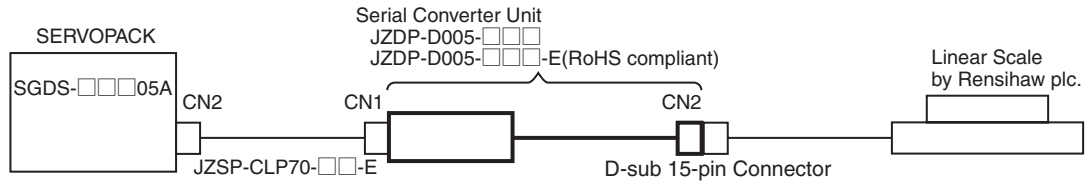
Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) manufactured by HEIDENHAIN Corp. can be directly connected. Contact HEIDENHAIN Corp. for details.
3 Use the same terminal for 5-V sensor and phase-W input.
4 Phase U, V, and W input are internally pulled up at 10 kΩ.

Serial Converter Unit Units: mm

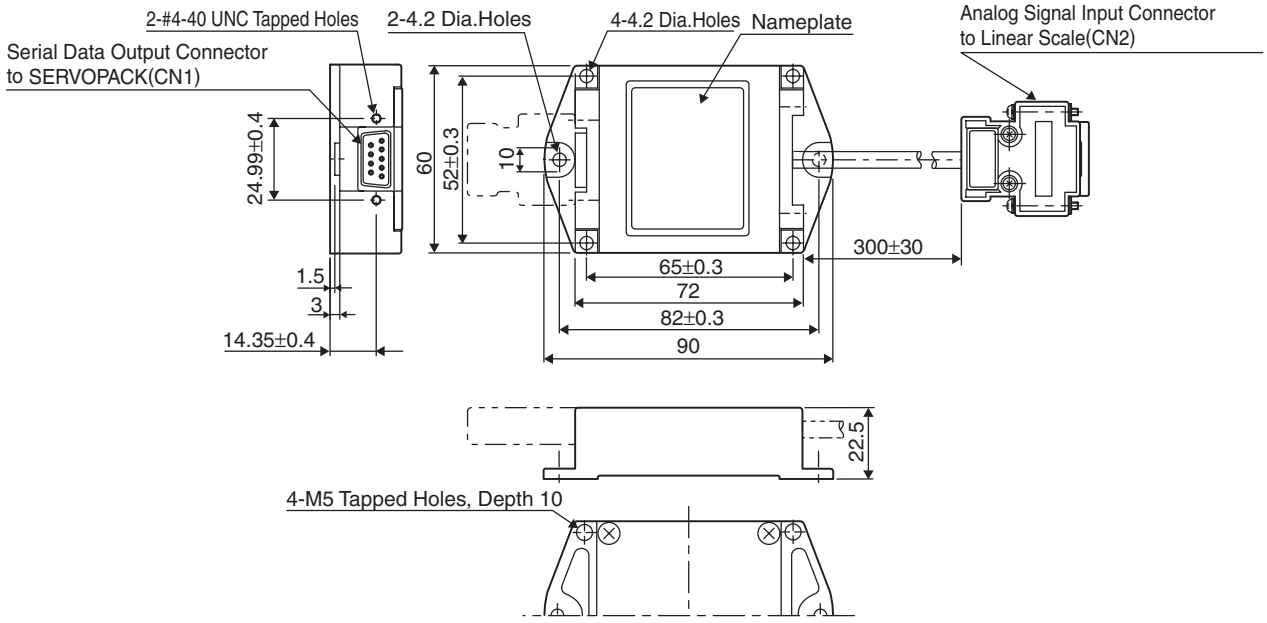
- Without Cable for Hall Sensor (For Linear Scale manufactured by Renishaw plc.)

Serial Converter Unit: JZDP-D005-□□□
JZDP-D005-□□□-E(RoHS compliant)

(1) Connection Example



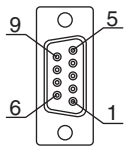
(2) External Dimensions



Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

SERVOPACK does not have the function to process Vq signals.

CN1
Serial Data Output to SERVOPACK

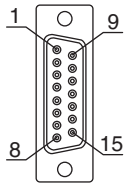


17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner (0 V)
Case	Shield

CN2
Analog Signal Input to Linear Scale



17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK Ltd.

・RoHS compliant
17JE-13150-02(D8C)ACG
(Socket)

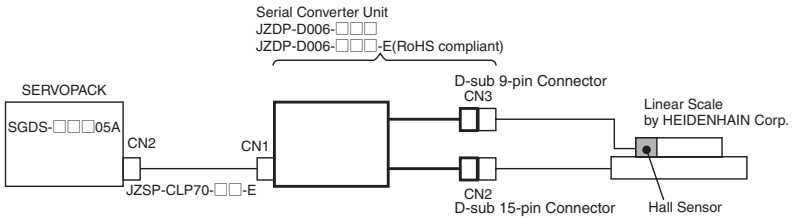
Notes:1 Do not use the unused pins.
2 The linear scale (analog 1 Vp-p output, D-sub 15-pin, male) by Renishaw plc. can be directly connected. However, the BID and DIR signals are not connected.
3 Use the connector to the linear scale to change the zero point specifications of the linear scale.

Serial Converter Unit Units: mm

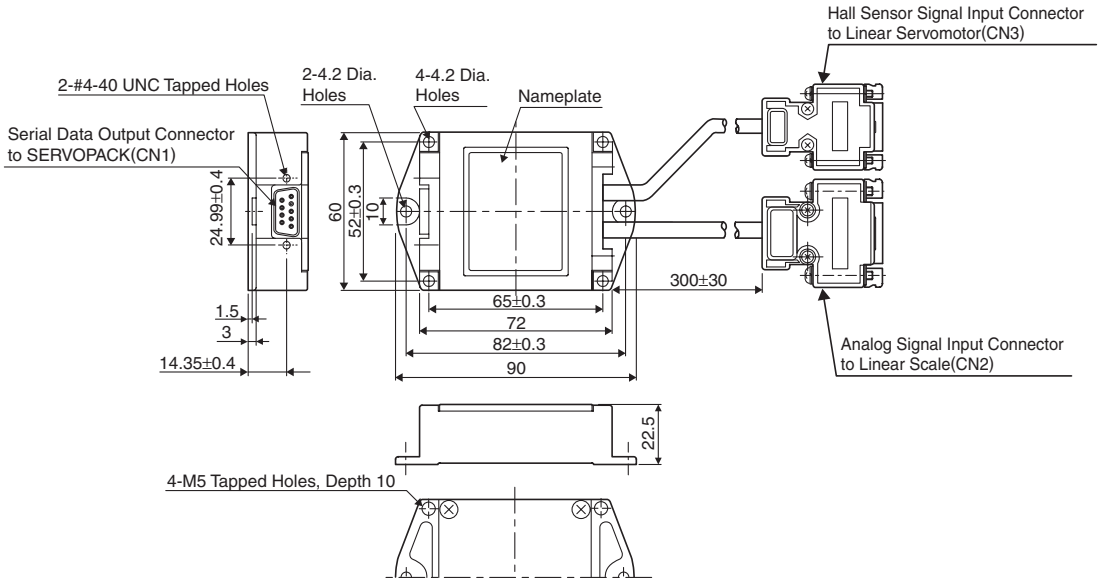
● With Cable for Hall Sensor (For Linear Scale manufactured by HEIDENHAIN corporation)

Serial Converter Unit: JZDP-D006-□□□
JZDP-D006-□□□-E(RoHS compliant)

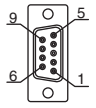
(1) Connection Example



(2) External Dimensions



CN1
Serial Data Output
to SERVOPACK

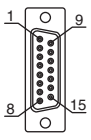


17-series Connector:
17LE-13090-27
(Socket) by DDK. Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale

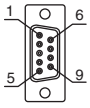


17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0 V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

CN3
Hall Sensor Signal Input
to Linear Servomotor



17-series Connector:
17JE-13090-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13090-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

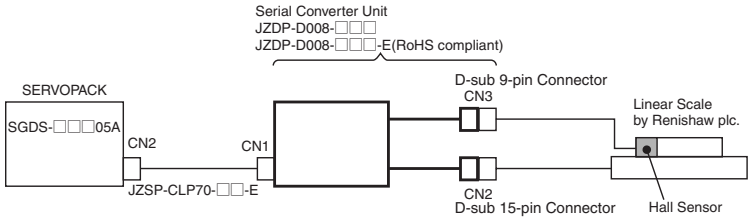
Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) by HEIDENHAIN Corp. can be directly connected. Contact HEIDENHAIN Corp. for details.
3 Phase U, V, and W input are internally pulled up at 10 kΩ.

Serial Converter Unit Units: mm

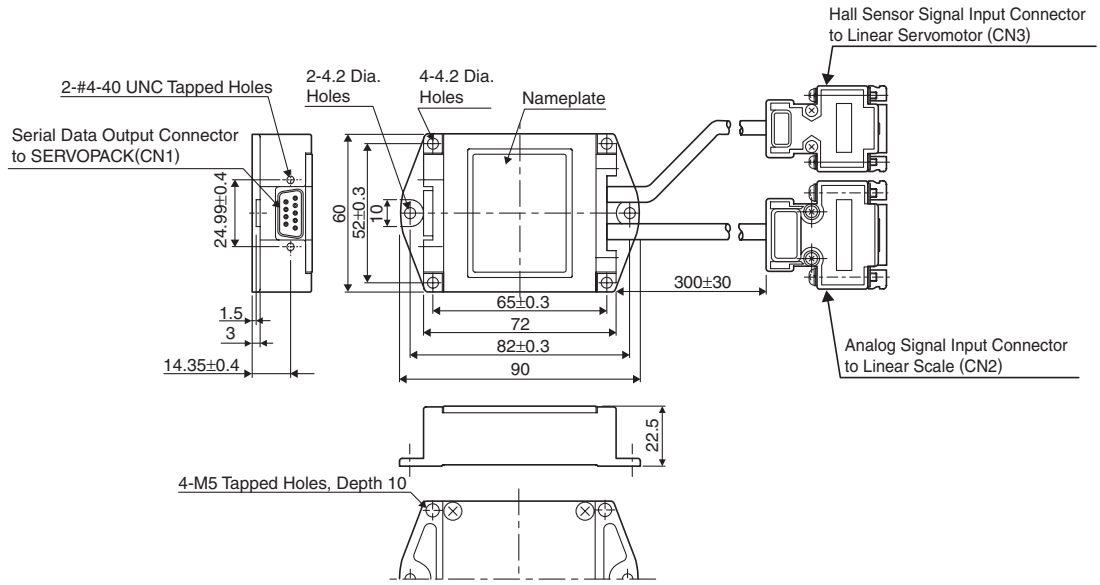
- With Cable for Hall Sensor (For Linear Scale manufactured by Renishaw plc.)

Serial Converter Unit: JZDP-D008-□□□
JZDP-D008-□□□-E (RoHS compliant)

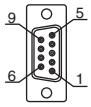
(1) Connection Example



(2) External Dimensions



CN1
Serial Data Output
to SERVOPACK

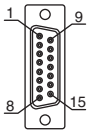


17-series Connector:
17LE-13090-27
(Socket) by DDK. Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale

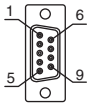


17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner
Case	Shield

CN3
Hall Sensor Signal Input
to Linear Servomotor



17-series Connector:
17JE-13090-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13090-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1 Vp-p output, D-sub 15-pin, male) by Renishaw plc. can be directly connected. However, the BID and DIR signals are not connected.
3 Use the connector to the linear scale to change the zero point specifications of the linear scale.
4 Phase U, V, and W input are internally pulled up at 10 kΩ.

Flexible Cables

● Life of Flexible Cable

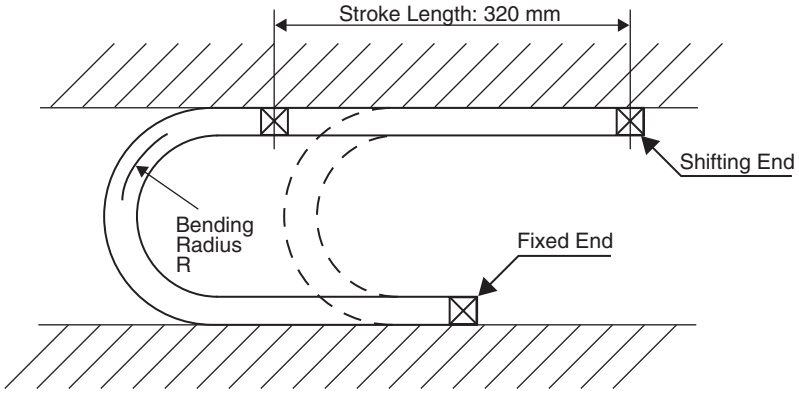
The following flexible cables have a long flex life of 10 million or more flex cycles as proven in rolling flex tests with the recommended bending radius shown in the table.

Cable	Model No.	Recommended Bending Radius mm
Linear Servomotor Main Circuit Cables	JZSP-CLN11-□□	35
	JZSP-CLN21-□□	38
	JZSP-CLN39-□□	50
	JZSP-CLN14-□□	35
Connection Cables for Linear Scales	JZSP-CLL00-□□	57
Connection Cables for Hall Sensors	JZSP-CLL10-□□	46
Connection Cables for Serial Converter Units	JZSP-CLP70-□□	46

● Testing Conditions

1 Repeatedly flex the cable back and forth in a linear motion for a stroke length of 320 mm using the test equipment as shown.

2 Connect the lead wires in parallel, and count the number of times that the cable can be bent until one of the lead wires becomes broken or disconnected. Every time that the cable is bent and returned to its original position counts as one test cycle.



Notes: 1 The life of flexible cable greatly differs in accordance with the amount of mechanical shock applied to the cable and with the methods used to wire or fix the cable. The cable life listed here is for reference only because it was measured under specified testing conditions.

2 The life of flexible cable indicates the number of bending life in which stranded wires are electrically conducted and by which no cracks and damages that affects the performance of cable sheathing are caused. Disconnecting the shield wire is not taken into account.

Flexible Cables

- Wiring Precautions

Even if the recommended bending radius R is respected in the mechanical design, incorrect wiring may cause early disconnection. Observe the following precautions when wiring.

(1) Twisted cable

Straighten the flexible cables before wiring.

Twisted cables cause early disconnection. Check the indication on the cable surface to make sure that the cable is not twisted.

(2) Fixing method

Do not fix the moving points of the flexible cable. Stress on the fixed points may cause early disconnection. Fix the cable at the minimum number of points.

(3) Cable length

If the cable length is too long, it may cause the cable's sagging. Besides the cable length is too short, it may cause the excessive tension on the fixed points that will cause early disconnection. Use a flexible cable with the optimum length.

(4) Interference between cables

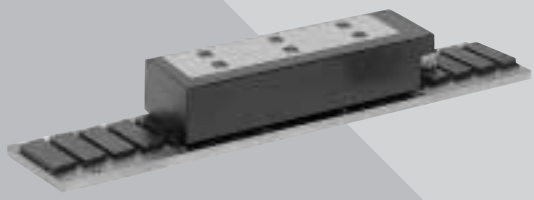
Avoid interference between cables.

Interference limits the motion of flexible cable, which causes early disconnection. Keep enough distance between cables, or provide a partition when wiring.

Linear Servomotors

SGLFW

(With F-type Iron Core)



Model Designation

●Moving Coil

SGL F W - 20 A 090 A P □

Linear Σ Series
Linear Servomotor

Servomotor Type

Code	Specifications
F	F-type iron core

W: Moving Coil

Magnet Height

Voltage
A: 200 VAC

Length of Moving Coil

Connector for Main Circuit Cable

Code	Specifications	Applicable Model
Blank	Connector by Tyco Electronics AMP K.K.	All models
D	Connector by interconnectron GmbH	SGLFW-35,-50, -1Z

Hall Sensor/Cooling Method

Code	Specifications
P	With hall sensor
Blank	Without hall sensor

Design Revision Order
A, B, ...

●Magnetic Way

SGL F M - 20324 A □

Linear Σ Series
Linear Servomotor

Servomotor Type

Code	Specifications
F	F-type iron core

M: Magnetic Way

Magnet Height

Options

Code	Specifications
Blank	Standard
C	With magnet cover

Design Revision Order
A, B, ...

Length of Magnetic Way

Features

- Direct-feed mechanism for high-speed and high-precision positioning.
- The magnetic attraction force between the moving and stationary members can be used effectively to increase the rigidity of the linear guidance by preloading the linear motion bearings.
- The magnetic preloading on certain types of compliant linear motion bearings can help increase the system's frequency response, improving its deceleration and settling performances.

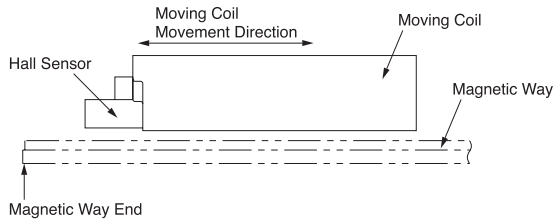
Application Examples

- Feeders and loaders
- Semiconductor equipment
- LCD manufacturing equipment

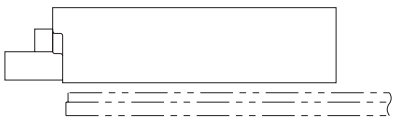
●Precautions on Moving Coil with Hall Sensor

When using a moving coil with a hall sensor, the magnetic way must completely cover the bottom of the hall sensor. Refer to the ex ample showing the correct installation.
When determining the length of the moving coil's stroke or the length of the magnetic way, consider the total length of the moving coil and the hall sensor unit. Refer to the following table.

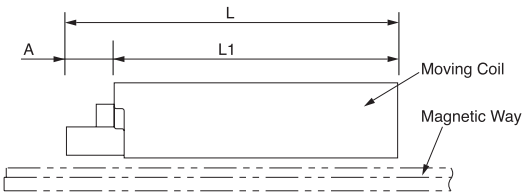
<Correct>



<Incorrect>



The total length of moving coil with hall sensor



Moving Coil Model SGLFW-	Length of Moving Coil L1(mm)	Length of Hall Sensor Unit A(mm)	Total Length L(mm)
20A090AP□	91	22	113
20A120AP□	127		149
35A120AP□	127	22	149
35A230AP□	235		257
50A200□P□	215	22	237
50A380□P□	395		417
1ZA200□P□	215	22	237
1ZA380□P□	395		417

Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Protection Methods: Self-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130℃ (Insulation class B)

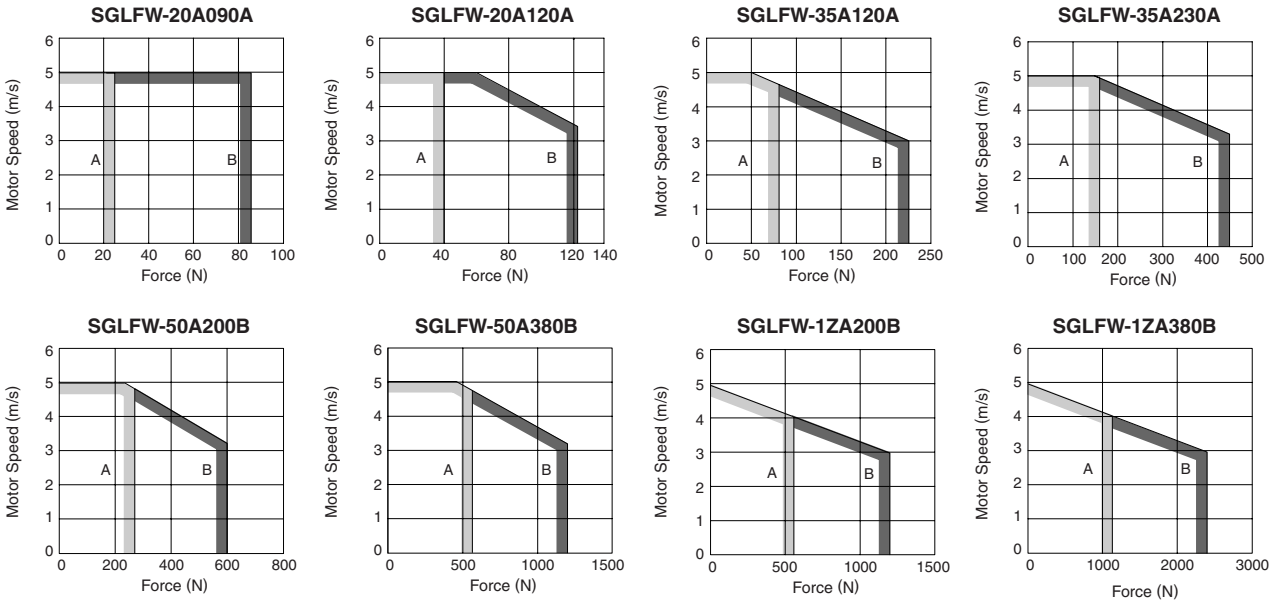
Voltage		200 V							
Linear Servomotor Model SGLFW-		20A		35A		50A		1ZA	
		090A	120A	120A	230A	200B	380B	200B	380B
Peak Speed	m/s	5	5	5	5	5	5	4.9	4.9
Rated Force*	N	25	40	80	160	280	560	560	1120
Rated Current*	Arms	0.7	0.8	1.4	2.8	5.0	10.0	8.7	17.5
Instantaneous Peak Force*	N	86	125	220	440	600	1200	1200	2400
Instantaneous Peak Current*	Arms	3.0	2.9	4.4	8.8	12.4	25.0	21.6	43.6
Moving Coil Mass	kg	0.7	0.9	1.3	2.3	3.5	6.9	6.4	11.5
Force Constant	N/Arms	36.0	54.0	62.4	62.4	60.2	60.2	69.0	69.0
BEMF Constant	V/(m/s)	12.0	18.0	20.8	20.8	20.1	20.1	23.0	23.0
Motor Constant	$N\sqrt{W}$	7.9	9.8	14.4	20.4	34.3	48.5	52.4	74.0
Electrical Time Constant	ms	3.2	3.3	3.6	3.6	15.9	15.8	18.3	18.3
Mechanical Time Constant	ms	11.0	9.3	6.2	5.5	3.0	2.9	2.3	2.1
Thermal Resistance (With Heat Sink)	K/W	4.35	3.19	1.57	0.96	0.56	0.38	0.47	0.20
Thermal Resistance (Without Heat Sink)	K/W	7.69	5.02	4.10	1.94	1.65	0.95	1.3	0.73
Magnetic Attraction	N	314	462	809	1590	1650	3260	3300	6520

Notes: 1 The items marked with an ✻ and "Force and Speed Characteristics" are the values at a motor winding temperature of 100℃ during operation in combination with a SERVOPACK. The others are at 20℃.
2 The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the moving coil.

Linear Servomotor Model SGLFW-	Heat Sink Size in mm
20A090A 20A120A	125×125×13
35A120A 35A230A	254×254×25
50A200B 1ZA200B 50A380B	400×500×40
1ZA380B	609×762×50

Ratings and Specifications

- Force and Speed Characteristics A Continuous Duty Zone B Intermittent Duty Zone



- Mechanical Specifications

(1) Impact Resistance

- Impact acceleration: 196 m/s^2
- Impact occurrences: twice

(2) Vibration Resistance

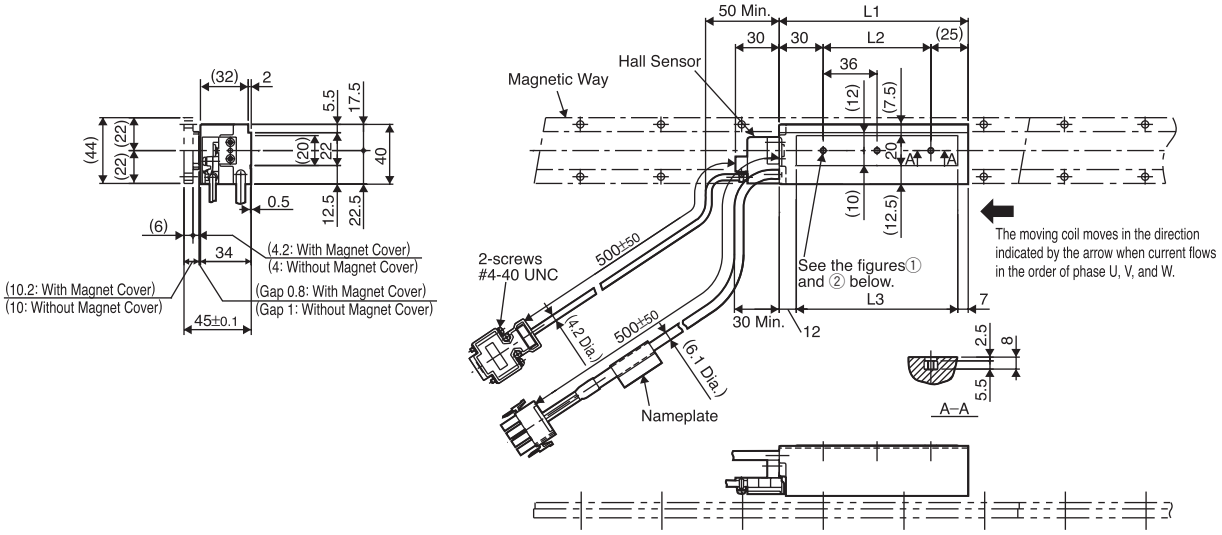
The linear servomotors will withstand the following vibration acceleration in three directions: Vertical, side to side, and front to back

- Vibration acceleration: 49 m/s^2

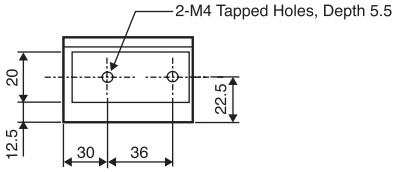
External Dimensions Units: mm

• SGLF□-20 Linear Servomotors

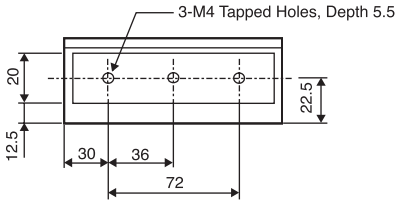
(1) Moving Coil: SGLFW-20A□□□A□ (With a connector by Tyco Electronics AMP K.K.)



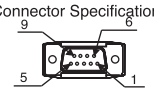
①SGLFW-20A090A□



②SGLFW-20A120A□



Hall Sensor Connector Specifications



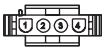
Pin Connector :
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5 V(Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V(Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug:350779-1
Pin :350218-3 or
350547-3(No.1 to 3)
350654-1
350669-1(No.4)
by Tyco Electronics AMP K.K.

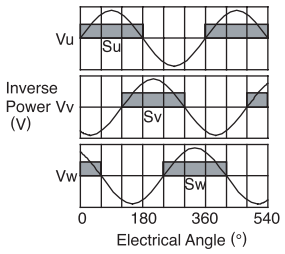
The Mating Connector

Cap : 350780-1
Socket: 350536-3 or
350550-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Black
4	FG	Green

Hall Sensor Output Signals

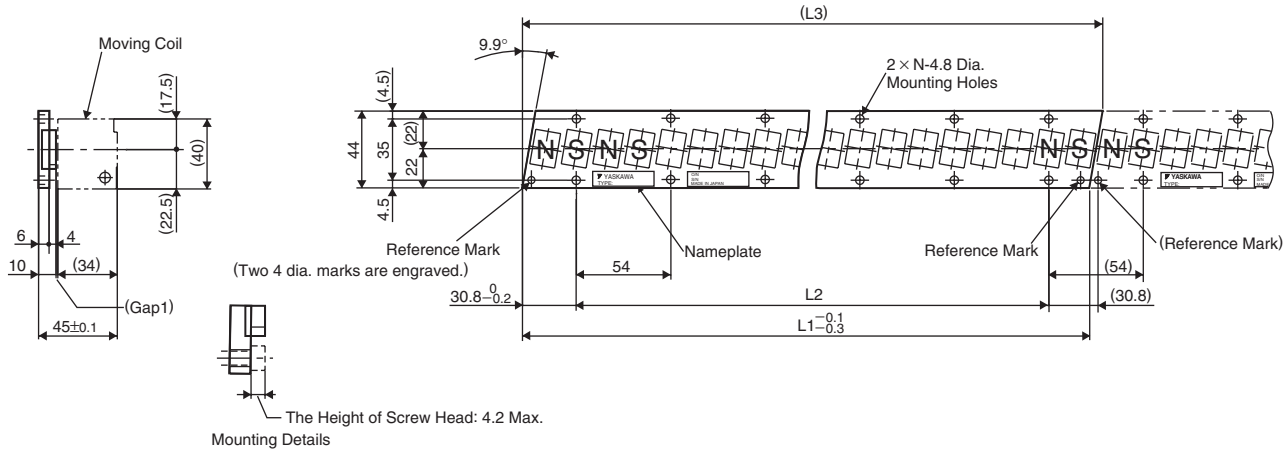
When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Moving Coil Model SGLFW-	L1	L2	L3	N	Approx. Mass kg
20A090A□	91	36	72	2	0.7
20A120A□	127	72	108	3	0.9

External Dimensions Units: mm

(2) Magnetic Way: SGLFM-20□□□A



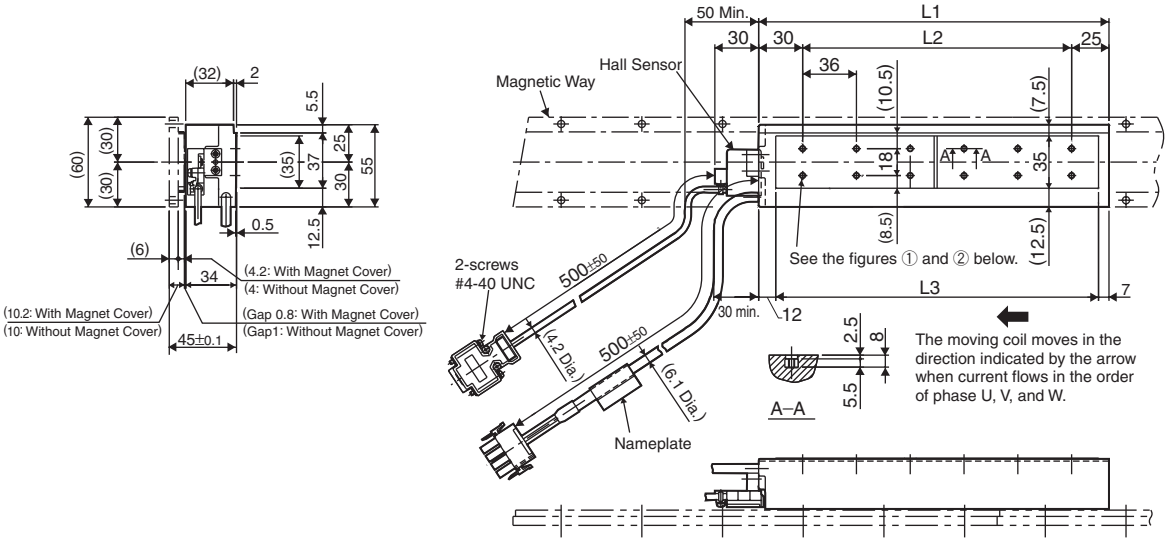
Notes: 1 Multiple SGLFM-20□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLFM-	$L1^{-0.1}_{-0.3}$	L2	(L3)	N	Approx. Mass kg
20324A	324	270 (54×5)	(331.6)	6	0.9
20540A	540	486 (54×9)	(547.6)	10	1.4
20756A	756	702 (54×13)	(763.6)	14	2

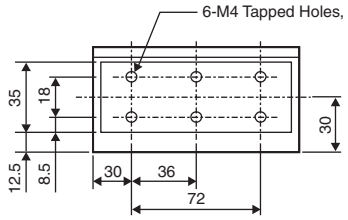
External Dimensions Units: mm

• SGLF□-35 Linear Servomotors

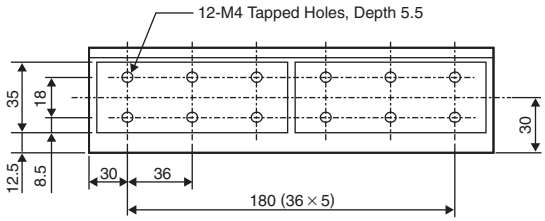
(1) Moving Coil: SGLFW-35A□□□A□ (With a connector by Tyco Electronics AMP K.K.)



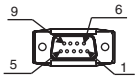
①SGLFW-35A120A□



②SGLFW-35A230A□



Hall Sensor
Connector Specifications

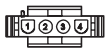


Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector
Socket Connector:
17JE-13090-02(D8C)
Stud:17L-002C or
17L-002C1

Pin No.	Name
1	+5 V(Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V(Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications

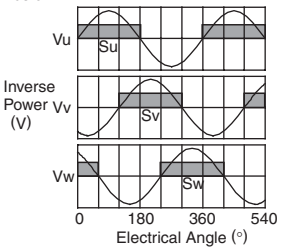


Plug: 350779-1
Pin : 350218-3 or
350547-3 (No.1 to 3)
350654-1
350669-1 (No.4)
by Tycon Electronics AMP K.K.

The Mating Connector
Cap : 350780-1
Socket: 350536-3 or
350550-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Black
4	FG	Green

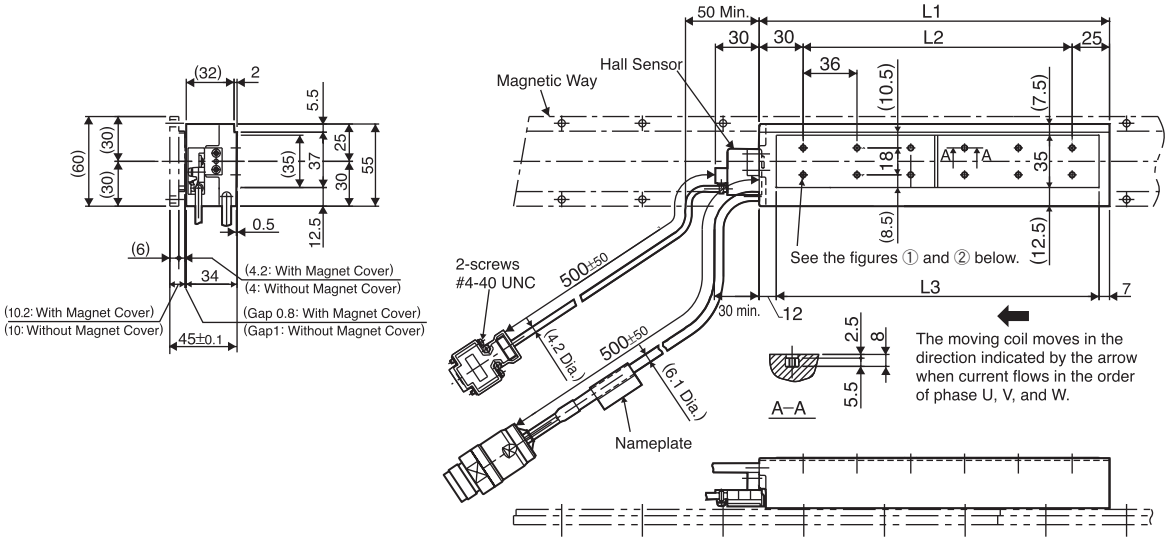
Hall Sensor Output Signals
When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



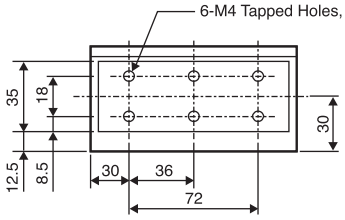
Moving Coil Model SGLFW-	L1	L2	L3	N	Approx. Mass kg
35A120A□	127	72	108	6	1.3
35A230A□	235	180	216	12	2.3

External Dimensions Units: mm

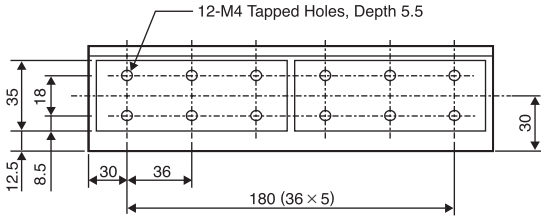
(2) Moving Coil: SGLFW-35A□□□A□D (With a connector by Interconnectron GmbH)



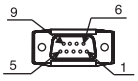
①SGLFW-35A120A□D



②SGLFW-35A230A□D



Hall Sensor
Connector Specifications



Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector: 17JE-13090-02(D8C) Stud:17L-002C or 17L-002C1

Pin No.	Name
1	+5 V(Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V(Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications

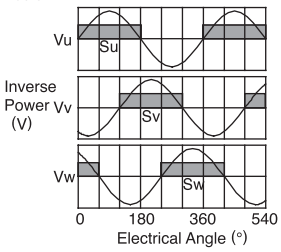
Ex tension: ARRA06AMRPN182
Pin : 021.279.1020
by Interconnectron GmbH

The Mating Connector

Plug : APRA06BFRDN170 Socket: 020.105.1020

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

Hall Sensor Output Signals
When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.

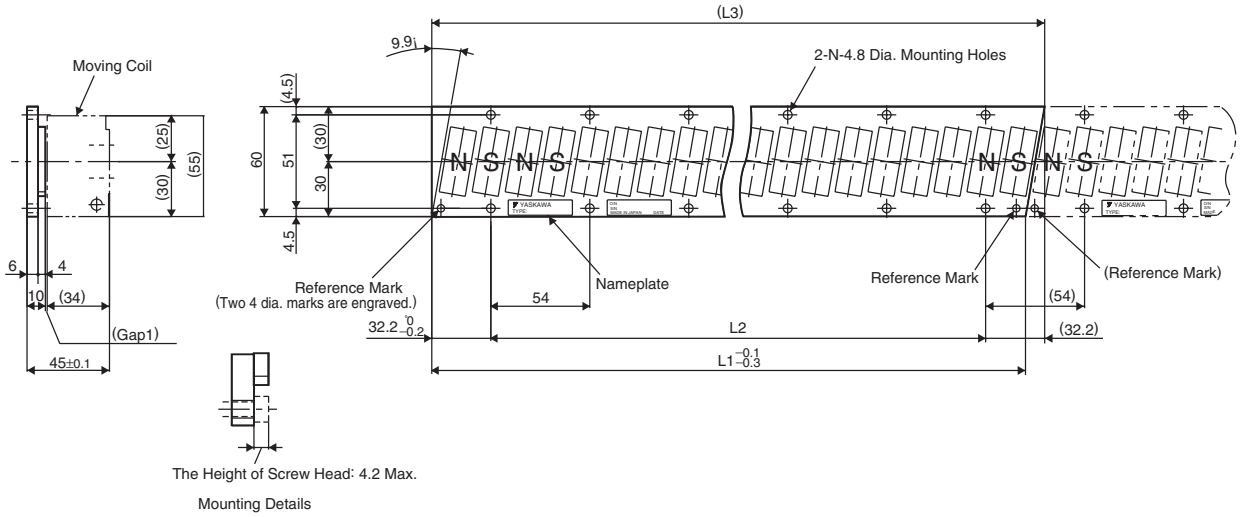


Moving Coil Model SGLFW-	L1	L2	L3	N	Approx. Mass kg
35A120A□D	127	72	108	6	1.3
35A230A□D	235	180	216	12	2.3

External Dimensions Units: mm

• SGLF□-35 Linear Servomotors

(3) Magnetic Way: SGLFM-35□□□A



Notes: 1 Multiple SGLFM-35□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.

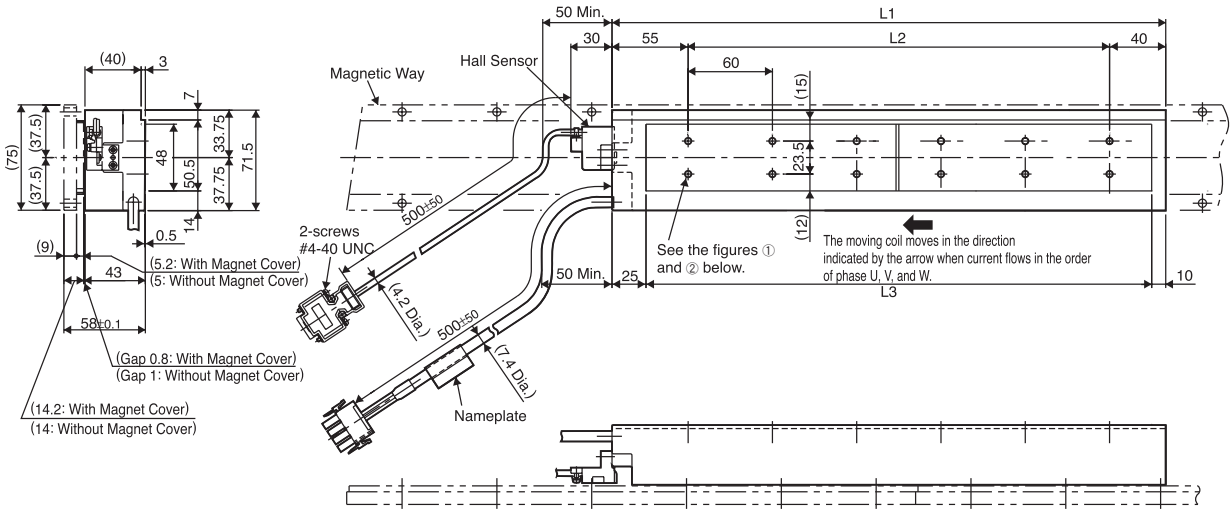
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLFM-	$L1^{-0.1}_{-0.3}$	L2	(L3)	N	Approx. Mass kg
35324A	324	270 (54×5)	(334.4)	6	1.2
35540A	540	486 (54×9)	(550.4)	10	2
35756A	756	702 (54×13)	(766.4)	14	2.9

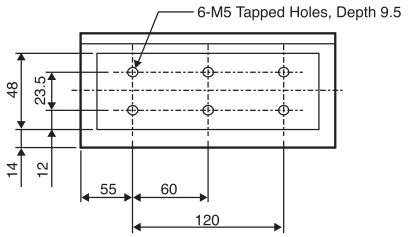
External Dimensions Units: mm

- SGLF□-50 Linear Servomotors

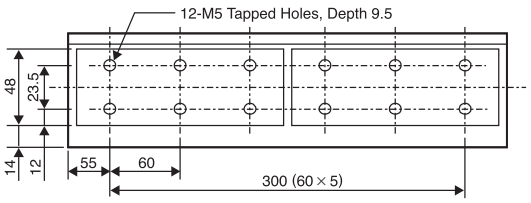
(1) Moving Coil: SGLFW-50A□□□B□ (With a connector by Tyco Electronics AMP K.K.)



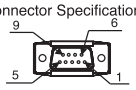
①SGLFW-50A200B□



②SGLFW-50A380B□



Hall Sensor Connector Specifications

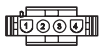


Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector
Socket Connector:
17JE-13090-02(D8C)
Stud:17L-002C or
17L-002C1

Pin No.	Name
1	+5 V(Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V(Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



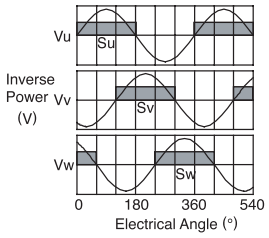
Plug: 350779-1
Pin : 350218-3 or
350547-3 (No.1 to 3)
350654-1
350669-1 (No.4)
by Tycon Electronics AMP K.K.

The Mating Connector
Cap : 350780-1
Socket: 350536-3 or
350550-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Black
4	FG	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each phase Vu,Vv, Vw becomes as shown in the figure below.

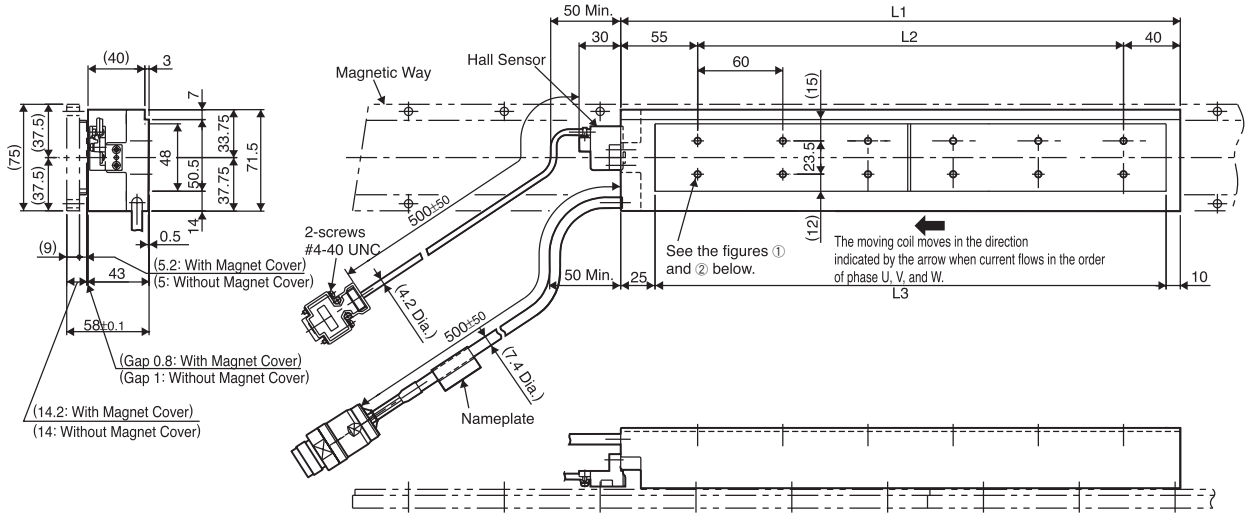


Moving Coil Model SGLFW-	L1	L2	L3	N	Approx. Mass kg
50A200B□	215	120	180	6	3.5
50A380B□	395	300	360	12	6.9

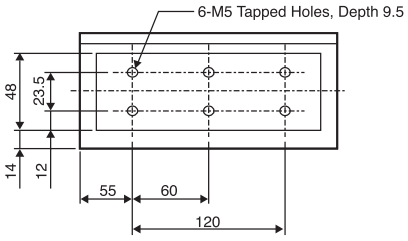
External Dimensions Units: mm

• SGLF□-50 Linear Servomotors

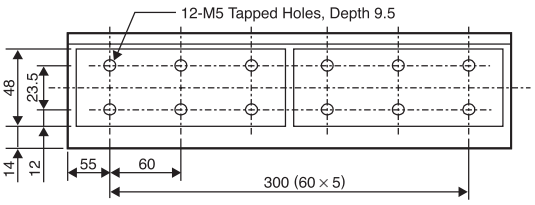
(2) Moving Coil: SGLFW-50A□□□B□D (With a connector by Interconnectron GmbH)



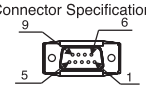
①SGLFW-50A200B□D



②SGLFW-50A380B□D



Hall Sensor
Connector Specifications



Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02(D8C)
Stud:17L-002C or
17L-002C1

Pin No.	Name
1	+5 V(Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V(Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications

Ex tension: ARRA06AMRPN182
Pin : 021.279.1020
by Interconnectron GmbH

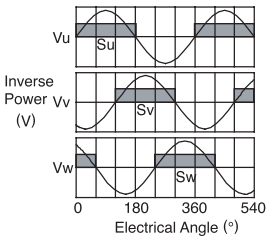
The Mating Connector

Plug : APRA06BFRDN170
Socket: 020.105.1020

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

Hall Sensor Output Signals

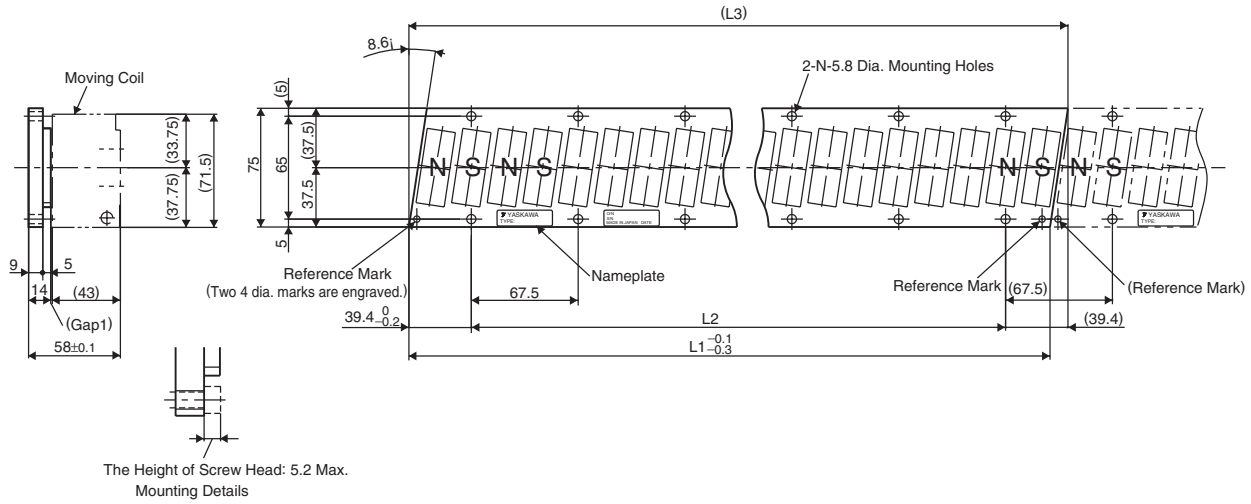
When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each phase Vu,Vv, Vw becomes as shown in the figure below.



Moving Coil Model SGLFW-	L1	L2	L3	N	Approx. Mass kg
50A200B□D	215	120	180	6	3.5
50A380B□D	395	300	360	12	6.9

External Dimensions Units: mm

(3) Magnetic Way: SGLFM-50□□□A



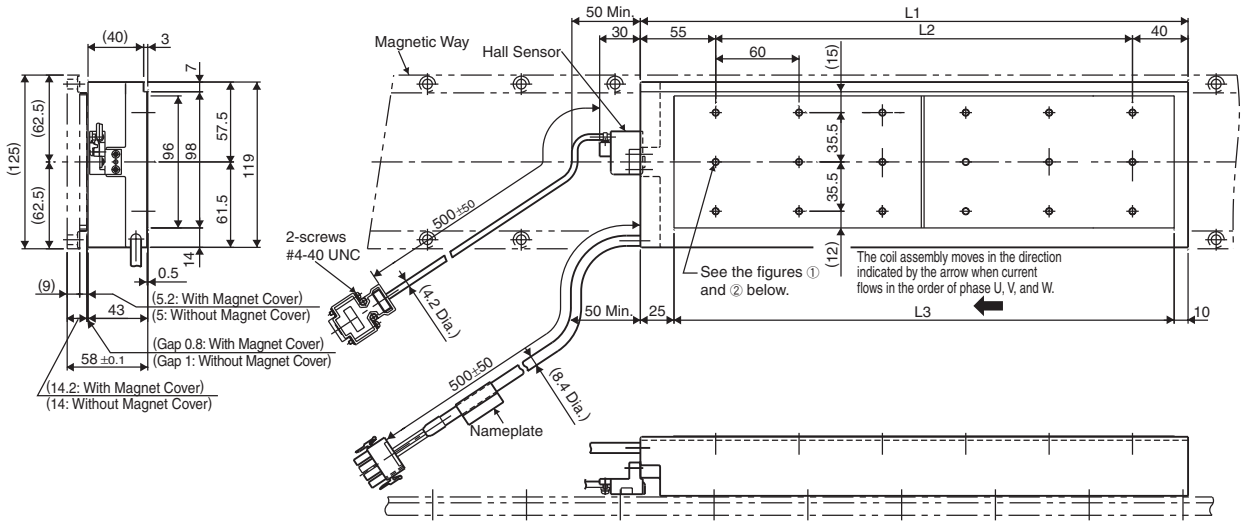
Notes: 1 Multiple SGLFM-50□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction as shown in the figure.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLFM-	L1 $^{-0.1}_{-0.3}$	L2	(L3)	N	Approx. Mass kg
50405A	405	337.5 (67.5×5)	(416.3)	6	2.8
50675A	675	607.5 (67.5×9)	(686.3)	10	4.6
50945A	945	877.5 (67.5×13)	(956.3)	14	6.5

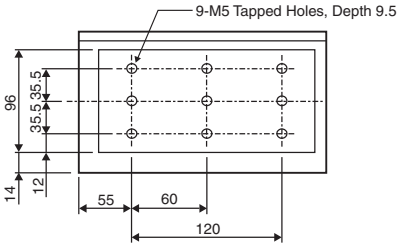
External Dimensions Units: mm

- SGLF□-1Z Linear Servomotors

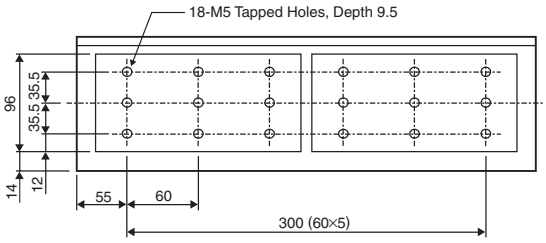
(1) Moving Coil: SGLFW-1ZA□□□B□ (With a connector by Tyco Electronics AMP K.K.)



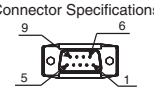
①SGLFW-1ZA200B□



②SGLFW-1ZA380B□



Hall Sensor Connector Specifications



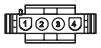
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5 V(Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V(Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin : 350218-3 or
350547-3 (No.1 to 3)
350654-1
350669-1 (No.4)
by Tyco Electronics AMP K.K.

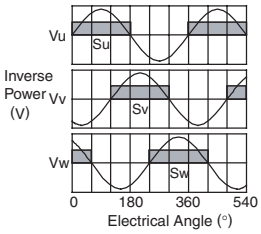
The Mating Connector

Cap : 350780-1
Socket: 350536-3 or
350550-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Hall Sensor Output Signals

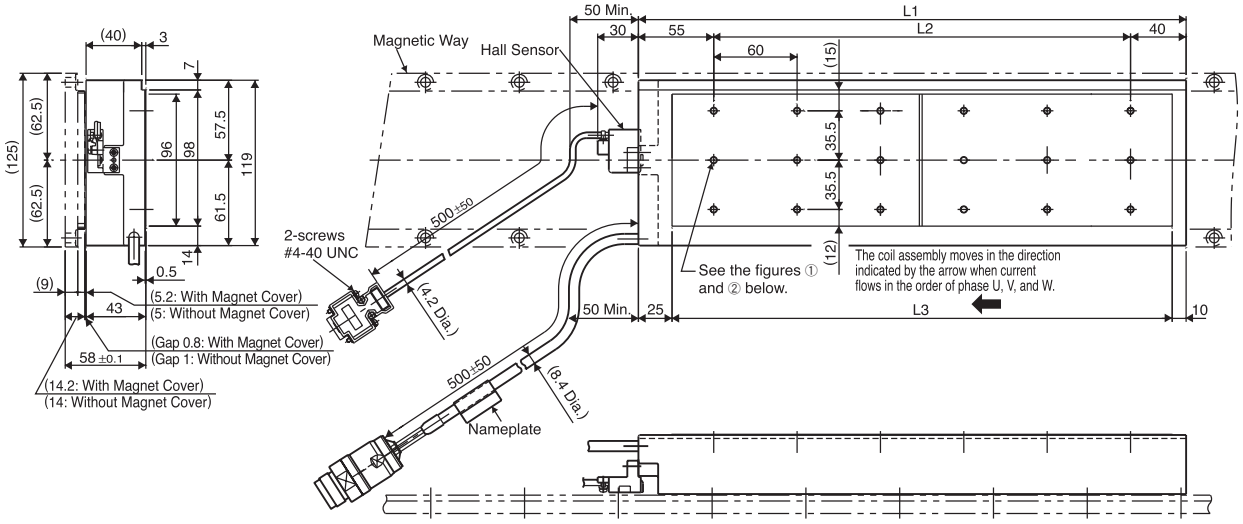
When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



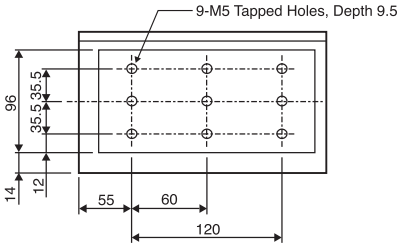
Moving Coil Model SGLFW-	L1	L2	L3	N	Approx. Mass kg
1ZA200B□	215	120	180	9	6.4
1ZA380B□	395	300	360	18	11.5

External Dimensions Units: mm

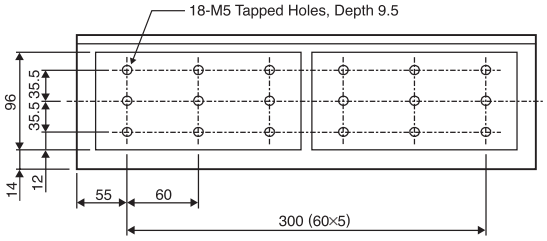
(2) Moving Coil: SGLFW-1ZA□□□B□D (With a connector by Interconnectron GmbH)



①SGLFW-1ZA200B□D



②SGLFW-1ZA380B□D



Hall Sensor
Connector Specifications

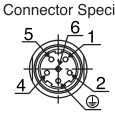
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector: 17JE-13090-02 (D8C) Stud: 17L-002C or 17L-002C1

Pin No.	Name
1	+5 V(Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V(Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications



Ex tension: ARRA06AMRPN182
Pin : 021.279.1020
by Interconnectron GmbH

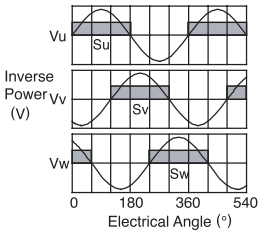
The Mating Connector

Plug : APRA06BFRDN170 Socket: 020.105.1020

Pin No.	Name
1	Phase U
2	Phase V
4	Phase W
5	Not used
6	Not used
⏚	Ground

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.

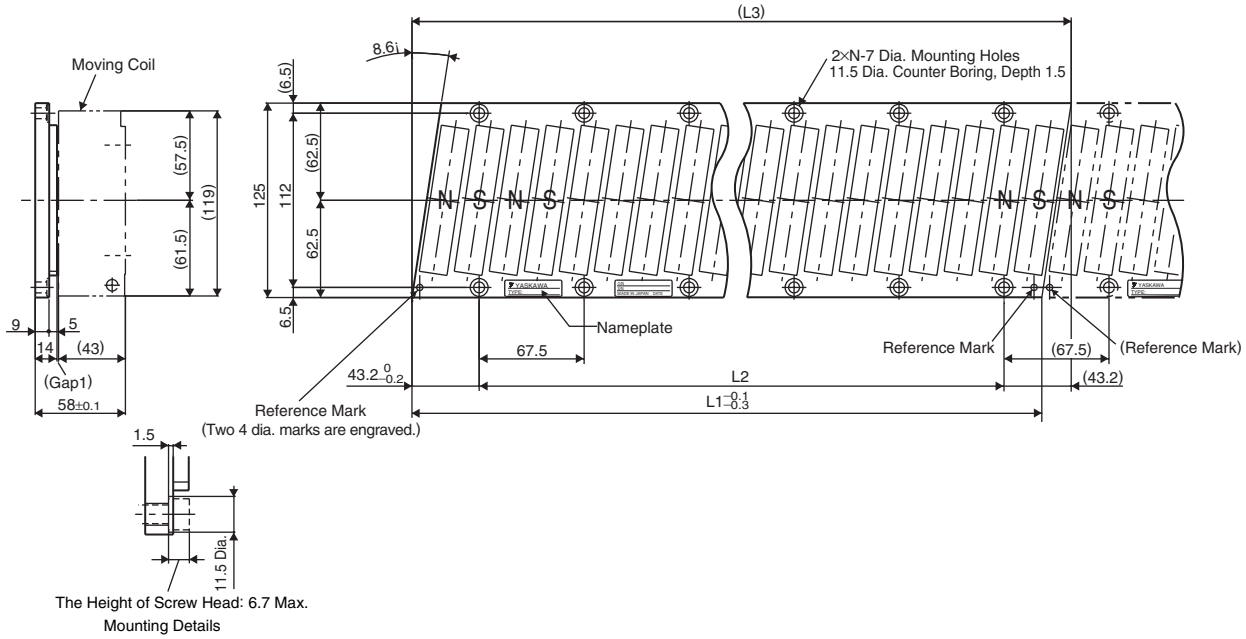


Moving Coil Model SGLFW-	L1	L2	L3	N	Approx. Mass kg
1ZA200B□D	215	120	180	9	6.4
1ZA380B□D	395	300	360	18	11.5

External Dimensions Units: mm

• SGLF□-1Z Linear Servomotors

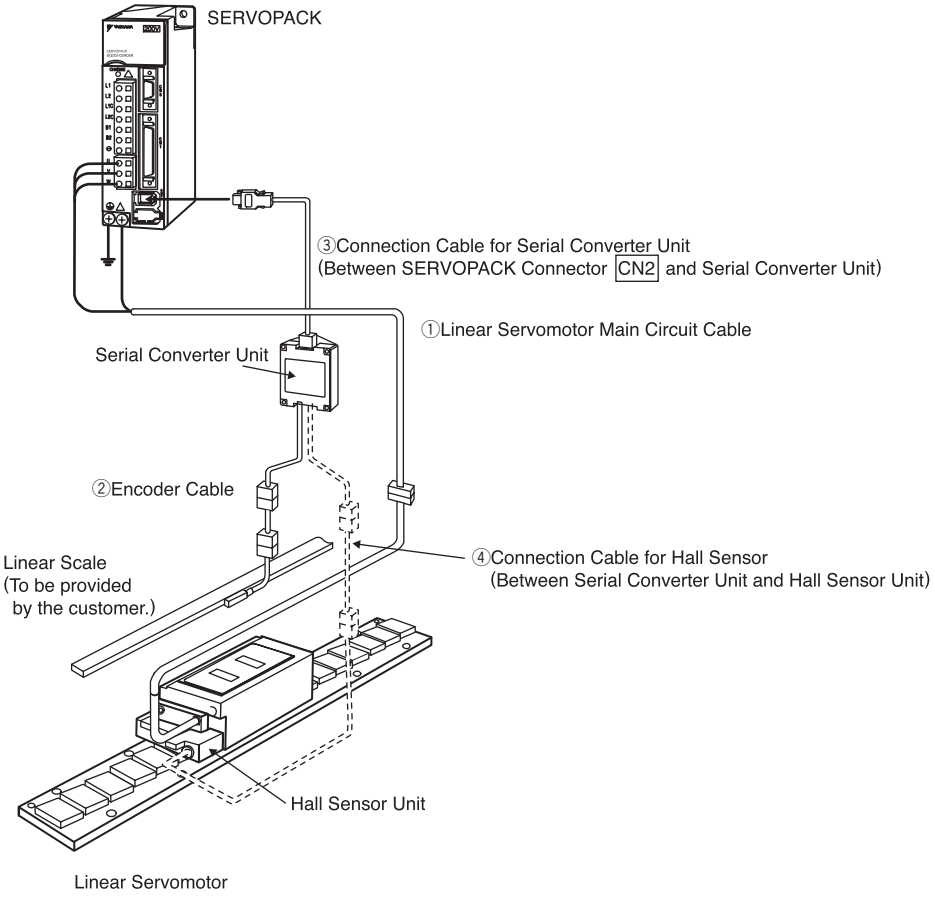
(3) Magnetic Way: SGLFM-1Z□□□A



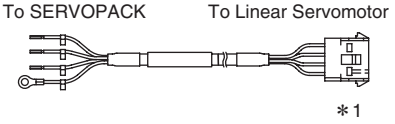
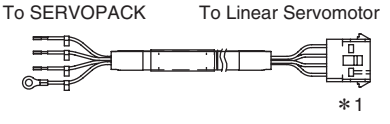
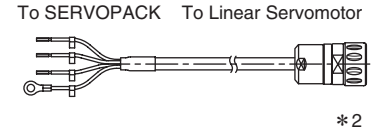
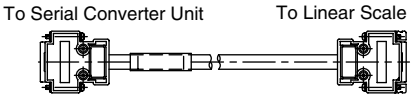
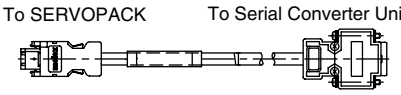
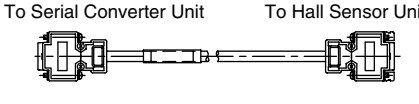
Notes: 1 Multiple SGFLM-1Z□□□A magnetic ways can be connected. Connect magnetic ways so that the reference marks match one on the other in the same direction.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLFM-	L1 -0.1 -0.3	L2	(L3)	N	Approx. Mass kg
1Z405A	405	337.5 (67.5×5)	(423.9)	6	5
1Z675A	675	607.5 (67.5×9)	(693.9)	10	8.3
1Z945A	945	877.5 (67.5×13)	(963.9)	14	12

Selecting Cables



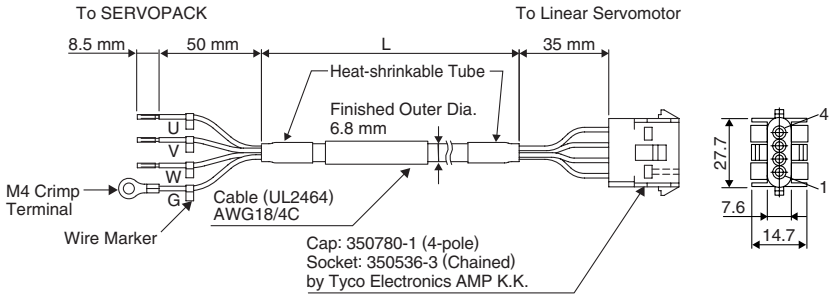
Selecting Cables

Name	Applicable Linear Servomotor Model	Length	Order No.	Specifications	Details
① Linear Servomotor Main Circuit Cables	SGLFW-20, SGLFW-35	1 m	JZSP-CLN11-01-E		(1)
		3 m	JZSP-CLN11-03-E		
		5 m	JZSP-CLN11-05-E		
		10 m	JZSP-CLN11-10-E		
		15 m	JZSP-CLN11-15-E		
		20 m	JZSP-CLN11-20-E		
	SGLFW-50, SGLFW-1Z	1 m	JZSP-CLN21-01-E		(2)
		3 m	JZSP-CLN21-03-E		
		5 m	JZSP-CLN21-05-E		
		10 m	JZSP-CLN21-10-E		
		15 m	JZSP-CLN21-15-E		
		20 m	JZSP-CLN21-20-E		
	SGLFW- □□A□□□□□D	1 m	JZSP-CLN14-01-E		(3)
		3 m	JZSP-CLN14-03-E		
		5 m	JZSP-CLN14-05-E		
		10 m	JZSP-CLN14-10-E		
		15 m	JZSP-CLN14-15-E		
		20 m	JZSP-CLN14-20-E		
② Encoder Cables	All Models	1 m	JZSP-CLL00-01-E		(4)
		3 m	JZSP-CLL00-03-E		
		5 m	JZSP-CLL00-05-E		
		10 m	JZSP-CLL00-10-E		
		15 m	JZSP-CLL00-15-E		
③ Connection Cables for Serial Converter Unit	All Models	1 m	JZSP-CLP70-01-E		(5)
		3 m	JZSP-CLP70-03-E		
		5 m	JZSP-CLP70-05-E		
		10 m	JZSP-CLP70-10-E		
		15 m	JZSP-CLP70-15-E		
		20 m	JZSP-CLP70-20-E		
④ Connection Cables for Hall Sensor	All Models	1 m	JZSP-CLL10-01-E		(6)
		3 m	JZSP-CLL10-03-E		
		5 m	JZSP-CLL10-05-E		
		10 m	JZSP-CLL10-10-E		
		15 m	JZSP-CLL10-15-E		

＊1:Connector by Tyco Electronics AMP K.K.
＊2:Connector by Interconnectron GmbH

Selecting Cables

(1) Linear Servomotor Main Circuit Cable: JZSP-CLN11-□□-E

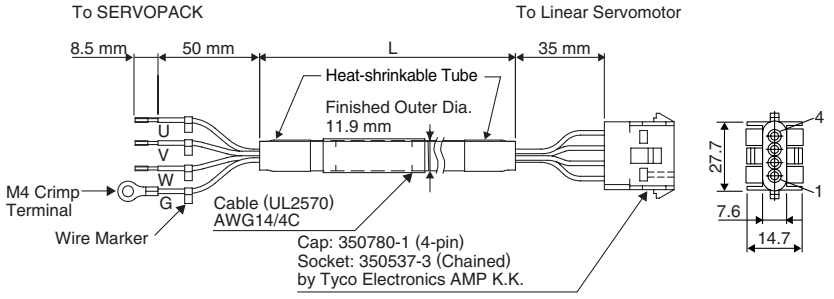


・Wiring Specifications

Leads to SERVOPACK / Connector to Linear Servomotor

Lead Color	Signal	Signal	Pin No.
Red	Phase U	Phase U	1
White	Phase V	Phase V	2
Blue	Phase W	Phase W	3
Green/Yellow	FG	FG	4

(2) Linear Servomotor Main Circuit Cable: JZSP-CLN21-□□-E

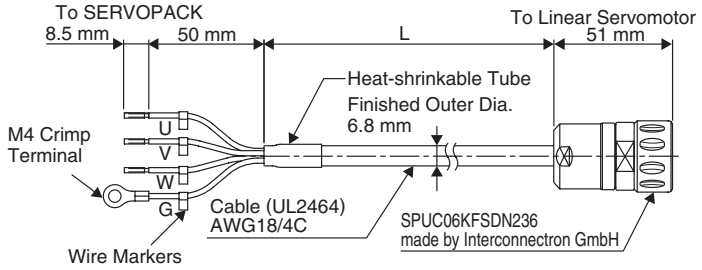


・Wiring Specifications

Leads to SERVOPACK / Connector to Linear Servomotor

Lead Color	Signal	Signal	Pin No.
Red	Phase U	Phase U	1
White	Phase V	Phase V	2
Blue	Phase W	Phase W	3
Green/Yellow	FG	FG	4

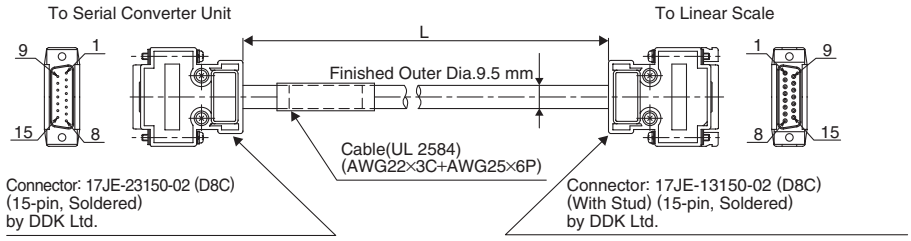
(3) Linear Servomotor Main Circuit Cable : JZSP-CLN14-□□-E



・Wiring Specifications

Leads to SERVOPACK		Connector to Linear Servomotor	
Wire Color	Signal	Signal	Pin No.
Black (White 1)	Phase U	Phase U	1
Black (White 2)	Phase V	Phase V	2
Black (White 3)	Phase W	Phase W	3
Green / Yellow	FG	–	4
		–	5
		FG	6

(4) Encoder Cable: JZSP-CLL00-□□-E

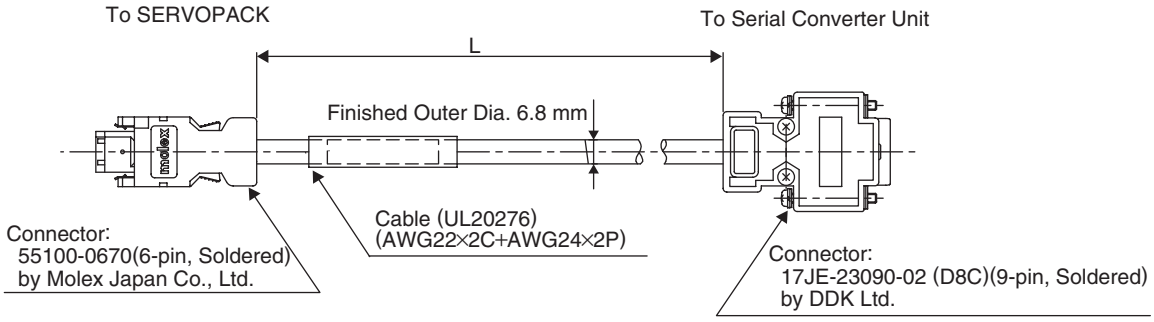


・Wiring Specifications

To Serial Converter Unit		To Linear Scale	
Pin No	Signal	Pin No.	Signal
1	/Cos (V1–)	1	/Cos (V1–)
2	/Sin (V2–)	2	/Sin (V2–)
3	Ref (V0+)	3	Ref (V0+)
4	+5V	4	+5V
5	5Vs	5	5Vs
6	BID	6	BID
7	Vx	7	Vx
8	Vq	8	Vq
9	Cos (V1+)	9	Cos (V1+)
10	Sin (V2+)	10	Sin (V2+)
11	/Ref (V0+)	11	/Ref (V0–)
12	0V	12	0V
13	0Vs	13	0Vs
14	DIR	14	DIR
15	Inner	15	Inner
Case	Shield	Case	Shield

Selecting Cables

(5) Connection Cable for Serial Converter Unit: JZSP-CLP70-□□-E



・Wiring Specifications

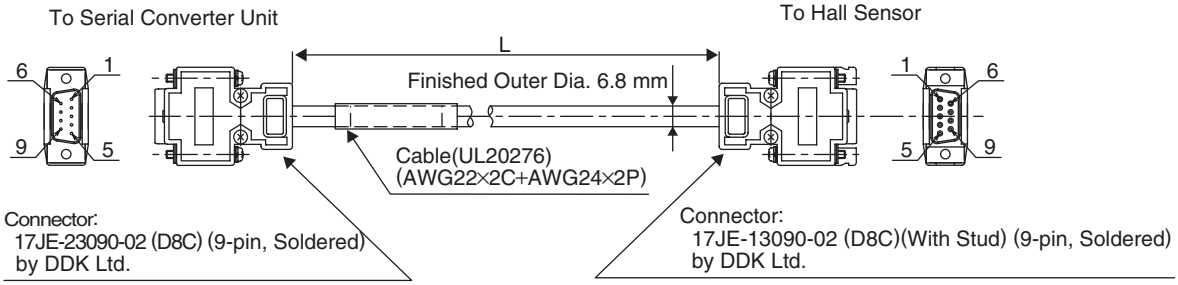
To SERVOPACK

Pin No.	Signal	Lead Color
1	PG5 V	Red
2	PG0 V	Black
3	–	–
4	–	–
5	PS	Light blue
6	/PS	Light blue/white
Shell	Shield	–

To Serial Converter Unit

Pin No.	Signal	Lead Color
1	+5 V	Red
5	0 V	Black
3	–	–
4	–	–
2	Phase S output	Light blue
6	Phase /S output	Light blue/white
Case	Shield	–
7	–	–
8	–	–
9	–	–

(6) Connection Cable for Hall Sensor: JZSP-CLL10-□□-E



・Wiring Specifications

To Serial Converter Unit

Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	–
7	–
8	–
9	–
Case	Shield

To Hall Sensor

Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	–
7	–
8	–
9	–
Case	Shield

Serial Converter Unit

● Characteristics and Specifications

Items		Specifications
Electrical Characteristics	Power Supply Voltage	+5.0 V±5%, ripple content 5% max.
	Current Consumption*1	120 mA typ. 350 mA max.
	Signal Resolution	Input 2-phase sine wave: 1/256 pitch
	Max. Response Frequency	250 kHz
	Analog Input Signals*2 (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V
	Hall Sensor Input Signal	CMOS level
	Output Signals*3	Position data, hall sensor information, and alarms
	Output Method	Serial data transmission [HDLC (High-level Data Link Control) protocol format with Manchester codes]
	Transmission Cycle	62.5 μs
	Output Circuit	Balanced transceiver (SN75LBC176 or the equivalent) Internal terminal resistance: 120Ω
Mechanical Characteristics	Approx. Mass	150 g
	Vibration Resistance	98 m/s^{2}max. (10 Hz to 2500 Hz) in three directions
	Shock Resistance	980 m/s^2, (11 ms) two times in three directions
Environmental Conditions	Operating Temperature	0˚C to 55˚C
	Storage Temperature	−20˚C to +80˚C
	Humidity	20% to 90%RH (no condensation)

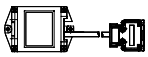
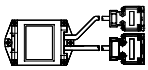
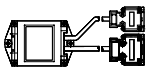
*1: The current consumption of the linear scale and hall sensor is not included in this value.
The current consumption of linear scale and hall sensor must be taken into consideration for the current capacity of host controller that supplies the power. The current consumption of hall sensor: Approx. 40 mA.

*2: Input a value within the specified range. Otherwise, incorrect position information is output, and the device may be damaged.

*3: The power is turned on, and the transmission is enabled after 100 ms to 300 ms.

● Model Designation

JZDP - D003 - 001 - E

Serial Converter Unit Model			
Symbol	Appearance	Applicable Linear Scale	Hall Sensor
D003		Made by HEIDENHAIN Corp.	None
D005		Made by Renishaw plc.	None
D006		Made by HEIDENHAIN Corp.	Provided
D008		Made by Renishaw plc.	Provided

Applicable Linear Servomotor		
Servomotor Model		Symbol
SGLFW- (F-type iron core)	20A090A	017
	20A120A	018
	35A120A	019
	35A230A	020
	50A200B	181
	50A380B	182
	1ZA200B	183
	1ZA380B	184

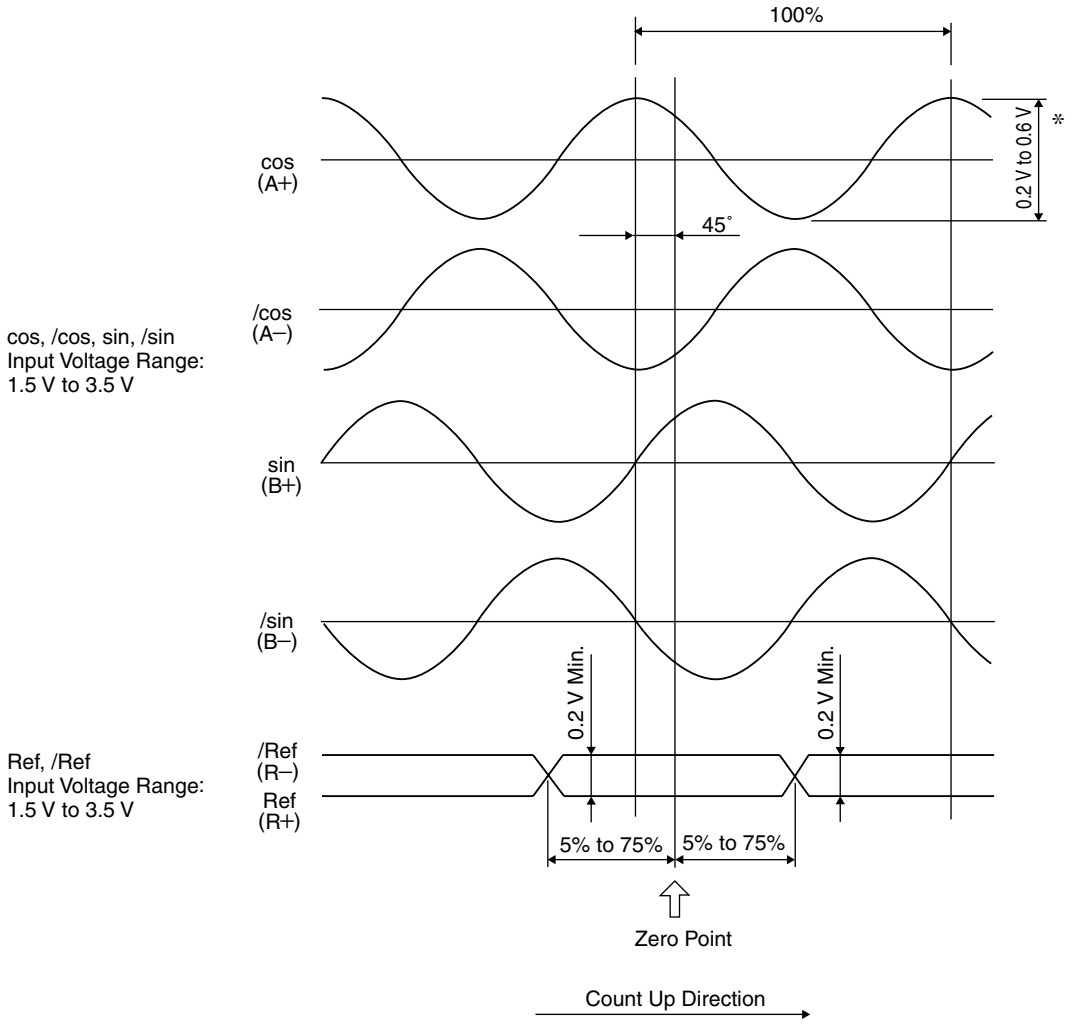
Code	Specifications
None	Not RoHS compliant
E	RoHS compliant

Note: Using the serial converter unit JZDP-A□□□ with SGDS SERVOPACK will void our guarantee.

Serial Converter Unit

● Analog Signal Input Timing

The following figure shows the input timing of the analog signals.
When the cos and sin signals are shifted 180 degrees, the differential signals are the /cos and /sin signals.
The specifications of the cos, /cos, sin, and /sin signals are identical except for the phase.
Input the signals Ref and /Ref so that they shall cross each other as shown in the figure because they are input into the converter. When they are crossed, the output data will be counted up.



*: If the analog signal amplitude declines to about 0.35 V because of differential amplitude, the serial converter outputs an alarm.

IMPORTANT

■Precautions

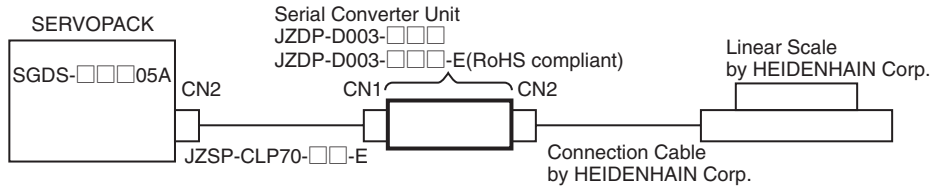
1 Never perform insulation resistance and withstand voltage tests.
2 When analog signals are input to the serial converter unit, noise influence on the analog signals affects the unit's ability to output correct position information. The analog cable must be as short as possible and shielded.
3 Use the serial converter unit in an environment without gases such as H_2S.
4 Do not connect or disconnect the unit while power is being supplied, or the unit may be damaged.
5 When using multiple axes, use a shield cable for each axis. Do not use a shield cable for multiple axes.

Serial Converter Unit Units: mm

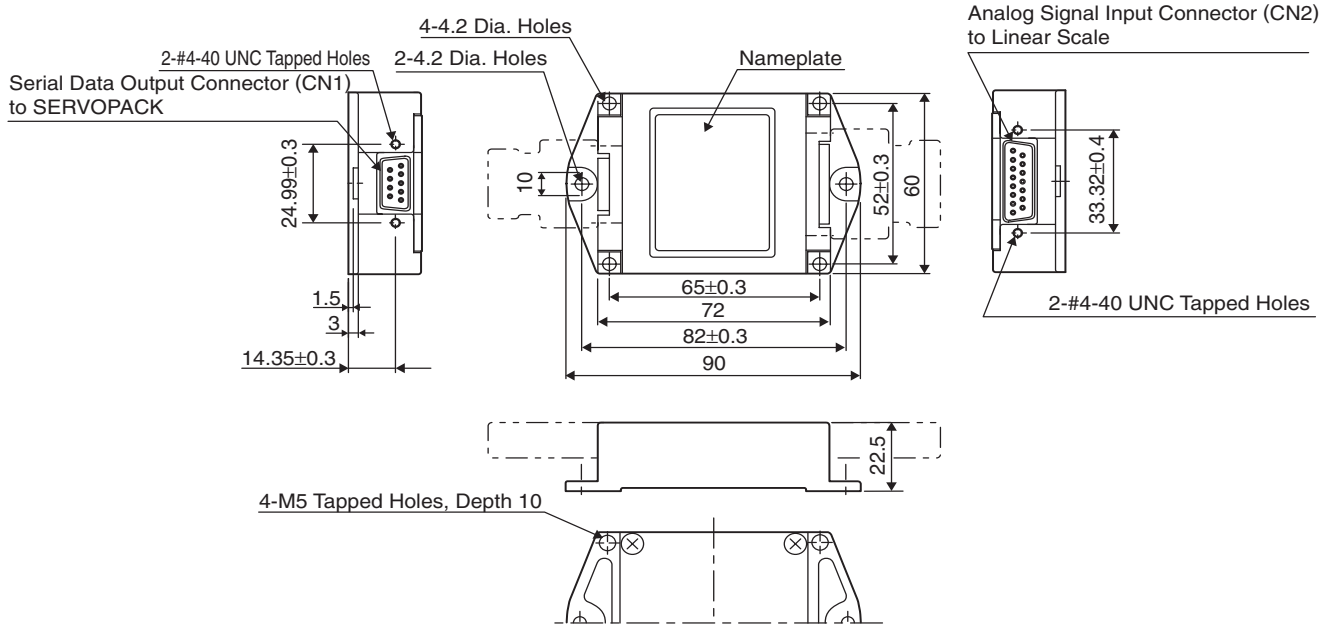
- Without Cable for Hall Sensor (For Linear Scale manufactured by HEIDENHAIN Corporation)

  Serial Converter Unit: JZDP-D003-□□□
  JZDP-D003-□□□-E(RoHS compliant)

(1) Connection Example



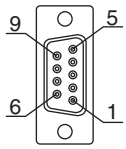
(2) External Dimensions



Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN1

Serial Data Output
to SERVOPACK



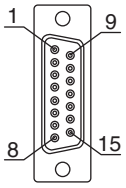
17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0 V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

CN2

Analog Signal Input
to Linear Scale



17-series Connector:
17LE-13150-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13150-27-FA
(Socket)

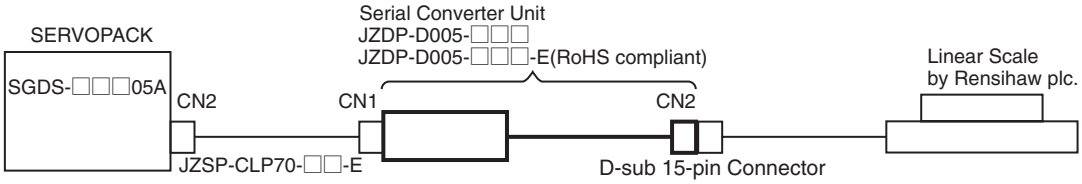
Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) manufactured by HEIDENHAIN Corp. can be directly connected. Contact HEIDENHAIN Corp. for details.
3 Use the same terminal for 5-V sensor and phase-W input.
4 Phase U,V, and W input are internally pulled up at 10 kΩ.

Serial Converter Unit Units: mm

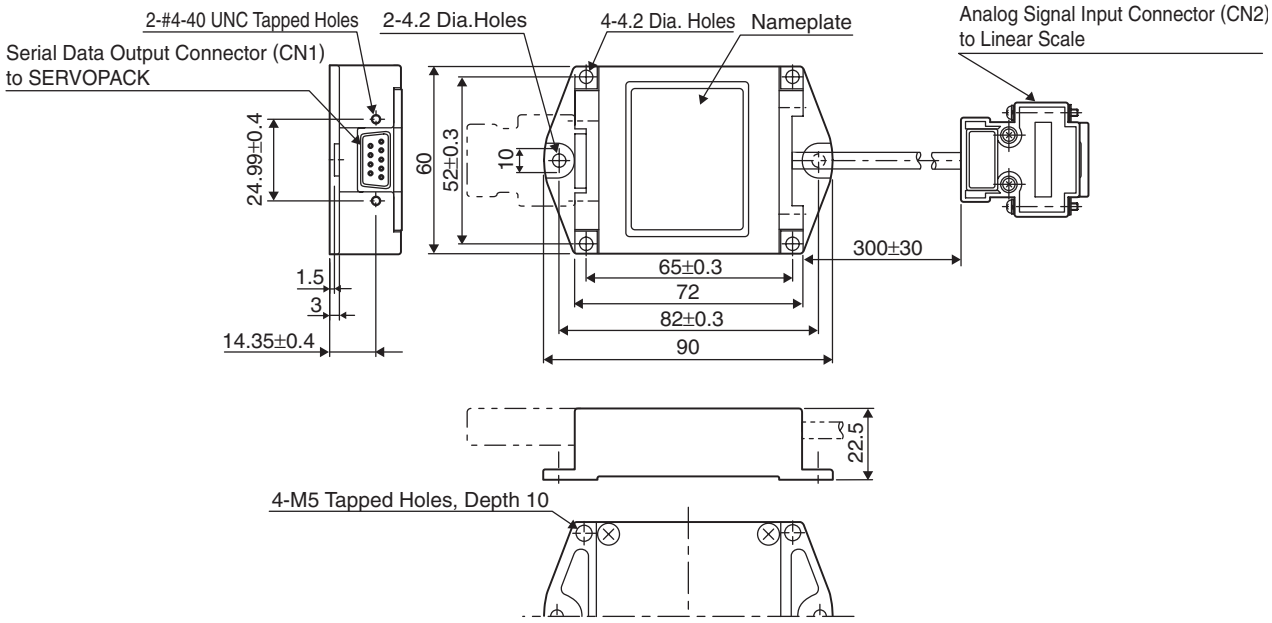
- Without Cable for Hall Sensor (For Linear Scale manufactured by Renishaw plc.)

Serial Converter Unit: JZDP-D005-□□□
JZDP-D005-□□□-E(RoHS compliant)

(1) Connection Example



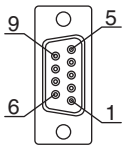
(2) External Dimensions



Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

SERVOPACK does not have the function to process Vq signals.

CN1
Serial Data Output to SERVOPACK

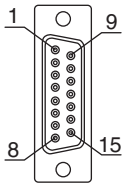


17-series Connector: 17LE-13090-27 (Socket) by DDK Ltd.

・RoHS compliant 17LE-13090-27-FA (Socket)

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner (0 V)
Case	Shield

CN2
Analog Signal Input to Linear Scale



17-series Connector: 17JE-13150-02 (D8C) (Socket) by DDK Ltd.

・RoHS compliant 17JE-13150-02(D8C)A-CG (Socket)

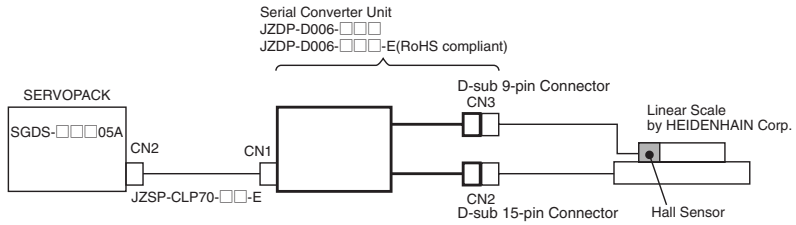
Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) by Renishaw plc. can be directly connected. However, the BID and DIR signals are not connected.
3 Use the connector to the linear scale to change the zero point specifications of the linear scale.

Serial Converter Unit Units: mm

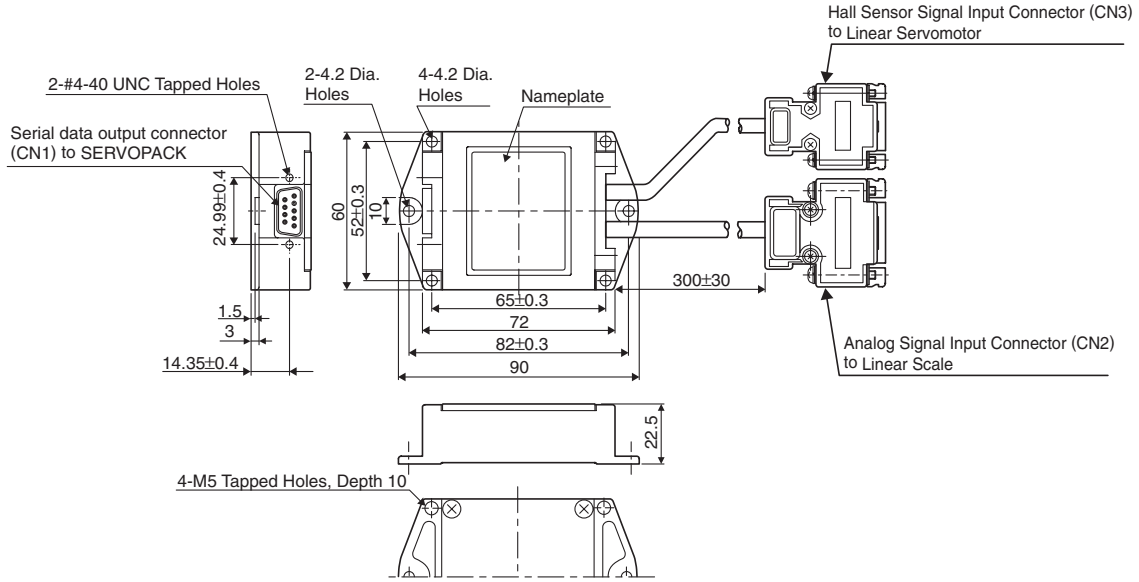
- With Cable for Hall Sensor (For Linear Scale manufactured by HEIDENHAIN Corporation)

Serial Converter Unit: JZDP-D006-□□□
JZDP-D006-□□□-E(RoHS compliant)

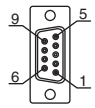
(1) Connection Example



(2) External Dimensions



CN1
Serial Data Output
to SERVOPACK

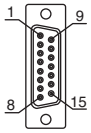


17-series Connector:
17LE-13090-27
(Socket) by DDK. Ltd.

[• RoHS compliant
17LE-13090-27-FA
(Socket)]

Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale

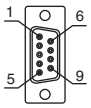


17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK. Ltd.

[• RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)]

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

CN3
Hall Sensor Signal Input
to Linear Servomotor



17-series Connector:
17JE-13090-02(D8C)
(Socket) by DDK. Ltd.

[• RoHS compliant
17JE-13090-02(D8C)A-CG
(Socket)]

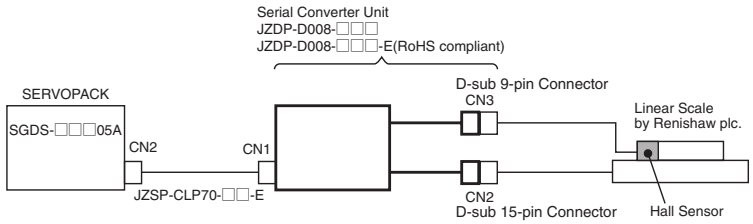
Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) by HEIDENHAIN Corp. can be directly connected. Contact HEIDENHAIN Corp. for details.
3 Phase V, V, and W input are internally pulled up at 10 kΩ.

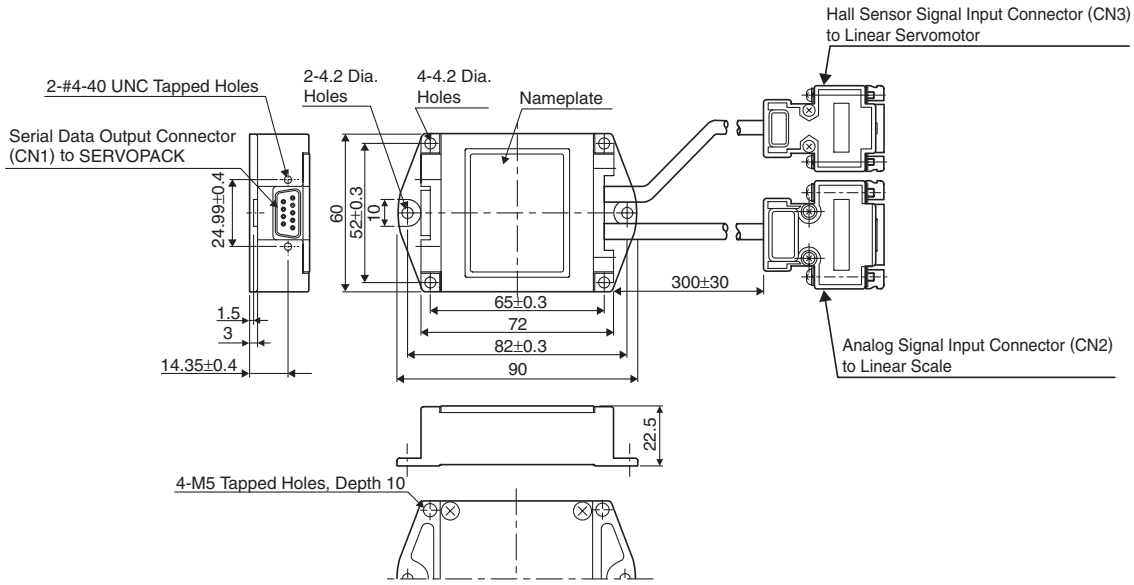
Serial Converter Unit Units: mm

- With Cable for Hall Sensor (For Linear Scale manufactured by Renishaw plc.)
  Serial Converter Unit: JZDP-D008-□□□
  JZDP-D008-□□□-E(RoHS compliant)

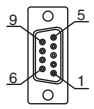
(1) Connection Example



(2) External Dimensions



CN1
Serial Data Output
to SERVOPACK

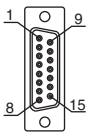


17-series Connector:
17LE-13090-27
(Socket) by DDK. Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale

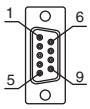


17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner
Case	Shield

CN3
Hall Sensor Signal Input
to Linear Servomotor



17-series Connector:
17JE-13090-02(D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13090-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) by Renishaw plc. can be directly connected.
However, the BID and DIR signals are not connected.
3 Use the connector to the linear scale to change the zero point specifications of the linear scale.
4 Phase U, V, and W input are internally pulled up at 10 kΩ.

Flexible Cables

● Life of Flexible Cable

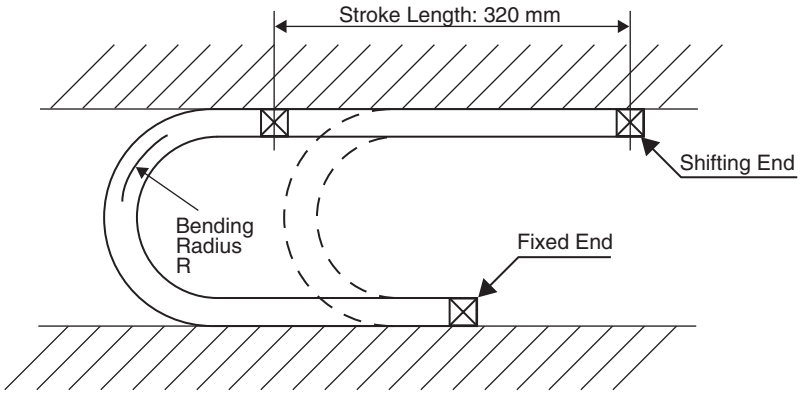
The following flexible cables have a long flex life of 10 million or more flex cycles as proven in rolling flex tests with the recommended bending radius shown in the table.

Cable	Model No.	Recommended Bending Radius mm
Linear Servomotor Main Circuit Cables	JZSP-CLN11-□□	35
	JZSP-CLN21-□□	38
	JZSP-CLN39-□□	50
	JZSP-CLN14-□□	35
Connection Cables for Linear Scales	JZSP-CLL00-□□	57
Connection Cables for Hall Sensors	JZSP-CLL10-□□	46
Connection Cables for Serial Converter Units	JZSP-CLP70-□□	46

● Testing Conditions

1 Repeatedly flex the cable back and forth in a linear motion for a stroke length of 320 mm using the test equipment as shown.

2 Connect the lead wires in parallel, and count the number of times that the cable can be bent until one of the lead wires becomes broken or disconnected. Every time that the cable is bent and returned to its original position counts as one test cycle.



Notes: 1 The life of flexible cable greatly differs in accordance with the amount of mechanical shock applied to the cable and with the methods used to wire or fix the cable. The cable life listed here is for reference only because it was measured under specified testing conditions.

2 The life of flexible cable indicates the number of bending life in which stranded wires are electrically conducted and by which no cracks and damages that affects the performance of cable sheathing are caused. Disconnecting the shield wire is not taken into account.

Flexible Cables

- Wiring Precautions

Even if the recommended bending radius R is respected in the mechanical design, incorrect wiring may cause the early disconnection. Observe the following precautions when wiring.

(1) Twisted Cable

Straighten the flexible cables before wiring.

Twisted cables cause early disconnection. Check the indication on the cable surface to make sure that the cable is not twisted.

(2) Fixing method

Do not fix the moving points of the flexible cable. Stress on the fixed points may cause early disconnection. Fix the cable at the minimum number of points.

(3) Cable length

If the cable length is too long, it may cause the cable's sagging. Besides the cable length is too short, it may cause the excessive tension on the fixed points that will cause early disconnection. Use a flexible cable with the optimum length.

(4) Interference between cables

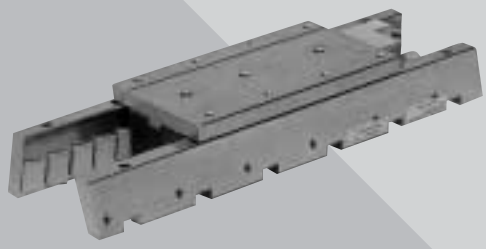
Avoid interference between cables.

Interference limits the motion of flexible cable, which causes early disconnection. Keep enough distance between cables, or provide a partition when wiring.

Linear Servomotors

SGLTW

(With T-type Iron Core)



Model Designation

●Moving Coil

SGL T W - 20 A 170 A P □

Linear Σ Series
Linear Servomotor

Servomotor Type

Code	Specifications
T	T-type iron core

W: Moving Coil

Magnet Height

Voltage
A: 200 VAC

Length of Moving Coil

Design Revison Order
A, B, ...

Connector for Main Circuit Cable

Code	Specifications	Applicable Model
Blank	Connector by Tyco Electronics AMP K.K.	SGLTW -20A□□□□□ -35A□□□□□ -50A□□□□□
	MS connector	SGLTW -40A□□□B□ -80A□□□B□

Hall Sensor/Cooling Method

Code	Specifications
P	With hall sensor
Blank	Without hall sensor

●Magnetic Way

SGL T M - 20 324 A □

Linear Σ Series
Linear Servomotor

Servomotor Type

Code	Specifications
T	T-type iron core

M: Magnetic Way

Magnet Height

Length of Magnetic Way

Options

Code	Specifications	Applicable Model
Blank	Standard	All models
C	With magnet cover	All models
Y	With base and magnet cover	SGLTM-20, -35, -40, -80 (Note)

Note: Not available for these models: the SGLTM-35□□□H and the SGLTM-50□□□H.

Design Revision Order
A, B, ...
H: High-efficiency Type

Features

- Direct-feed mechanism for high-speed and high-precision positioning.
- Yaskawa's unique construction principles of the TW linear motors negate the effects of the magnetic attraction force between the relative motor members.
- Lack of magnetic attraction helps to ex tend the life of the linear motion guides and to minimiz e operation noise.
- Very little cogging.

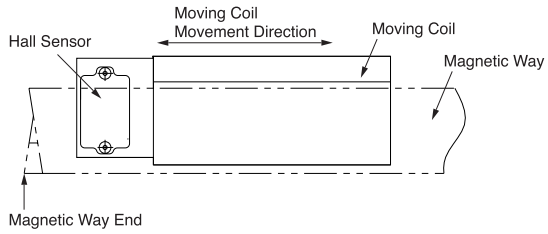
Application Examples

- Feeders and loaders
- Mounters
- Machine tools

●Precautions on Moving Coil with Hall Sensor

When using a moving coil with a hall sensor, the magnetic way must completely cover the bottom of the hall sensor. Refer to the ex ample showing the correct installation.
When determining the length of the moving coil's stroke or the length of the magnetic way, consider the total length of the moving coil and the hall sensor unit. Refer to the following table.

<Correct>



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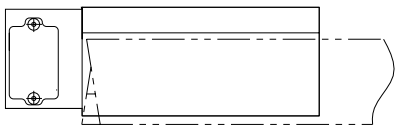
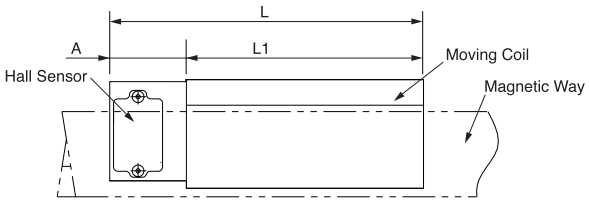


The total length of moving coil with hall sensor



Moving Coil Model SGLTW-	Length of Moving Coil L1(mm)	Length of Hall Sensor Unit A(mm)	Total Length L(mm)
20A170AP□	170	34	204
20A320AP□	315		349
20A460AP□	460		494
35A170AP□	170	34	204
35A320AP□	315		349
35A460AP□	460		494
35A170HP□	170	34	204
35A320HP□	315		349
50A170HP□	170	34	204
50A320HP□	315		349
40A400AP□	395	26	421
40A600AP□	585	36	621
80A400AP□	395	26	421
80A600AP□	585	36	621
40A400BP□	395	26	421
40A600BP□	575		601
80A400BP□	395	26	421
80A600BP□	575		601

Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Cooling Method: Self-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130℃ (Insulation class B)

Voltage		200 V												
Linear Servomotor Model SGLTW-□		20A			35A			40A		80A		35A		50A	
		170A	320A	460A	170A	320A	460A	400B	600B	400B	600B	170H	320H	170H	320H
Peak Speed	m/s	5	5	5	5	5	5	3.1	3.1	2.5	2.5	4.8	4.8	3.2	3.1
Rated Force*	N	130	250	380	220	440	670	670	1000	1300	2000	300	600	450	900
Rated Current*	Arms	2.3	4.4	6.7	3.5	7.0	10.7	7.3	10.9	11.1	17.1	5.1	10.1	4.9	9.8
Instantaneous Peak Force*	N	380	760	1140	660	1320	2000	2600	4000	5000	7500	600	1200	900	1800
Instantaneous Peak Current*	Arms	7.7	15.4	23.2	12.1	24.2	36.7	39.4	60.6	57.9	86.9	11.9	23.9	11.5	22.9
Moving Coil Mass	kg	2.5	4.6	6.7	3.7	6.8	10.0	15	23	24	35	4.9	8.8	6.0	11
Force Constant	N/Arms	61.0	61.0	61.0	67.5	67.5	67.5	99.1	99.1	126	126	64.0	64.0	98.5	98.5
BEMF Constant	V/(m/s)	20.3	20.3	20.3	22.5	22.5	22.5	33.0	33.0	42.0	42.0	21.3	21.3	32.8	32.8
Motor Constant	$N/\sqrt{W}$	18.7	26.5	32.3	26.7	37.5	46.4	61.4	75.2	94.7	116	37.4	52.9	50.3	71.1
Electrical Time Constant	ms	5.9	5.9	5.9	6.9	6.8	7.0	15.2	15.2	17.0	17.0	15.1	15.1	16.5	16.5
Mechanical Time Constant	ms	7.5	6.5	6.4	5.2	4.8	4.6	4.0	4.0	3.0	3.0	3.3	3.3	2.8	2.8
Thermal Resistance (With Heat Sink)	K/W	1.01	0.49	0.38	0.76	0.44	0.32	0.24	0.20	0.22	0.18	0.76	0.40	0.61	0.30
Thermal Resistance (Without Heat Sink)	K/W	1.82	1.11	0.74	1.26	0.95	0.61	0.57	0.40	0.47	0.33	1.26	0.83	0.97	0.80
Magnetic Attraction*1	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnetic Attraction*2	N	1800	1590	2380	1400	2780	4170	3950	5890	7650	11400	1400	2780	2000	3980

*1: The unbalanced magnetic gap resulted from the moving coil installation condition causes a magnetic attraction on the moving coil.
*2: The value indicates the magnetic attraction generated on one side of the magnetic way.
Notes: 1 The items marked with an * and "Force and Speed Characteristics" are the values at a motor winding temperature of 100℃ during operation in combination with a SERVOPACK. The others are at 20℃
2 The above specifications show the values under the cooling condition when a heat sink (aluminium board) listed in the following table is mounted on the moving coil.

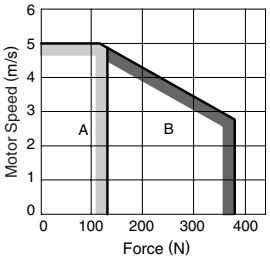
Linear Servomotor Model SGLTW-	Heat Sink Size in mm
20A170A 35A170A	254×254×25
20A320A 20A460A 35A170H 35A320A 35A320H 35A460A 50A170H	400×500×40
40A400B 40A600B 50A320H 80A400B 80A600B	609×762×50

Ratings and Specifications

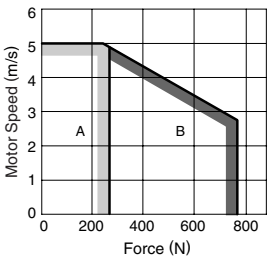
● Force and Speed Characteristics

A: Continuous Duty Zone B: Intermittent Duty Zone

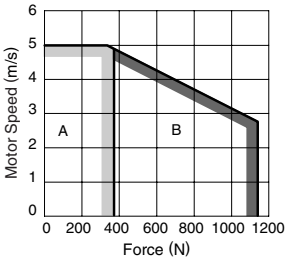
SGLTW-20A170A



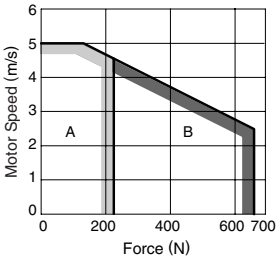
SGLTW-20A320A



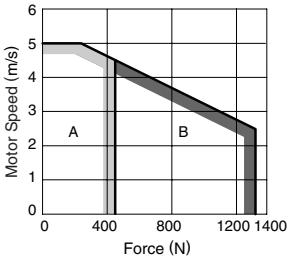
SGLTW-20A460A



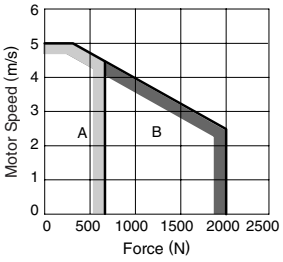
SGLTW-35A170A



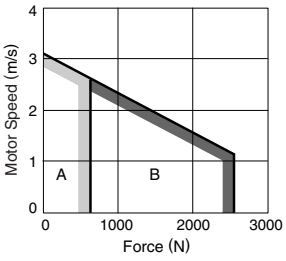
SGLTW-35A320A



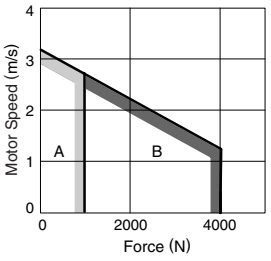
SGLTW-35A460A



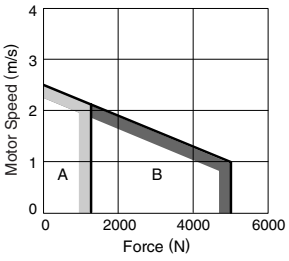
SGLTW-40A400B



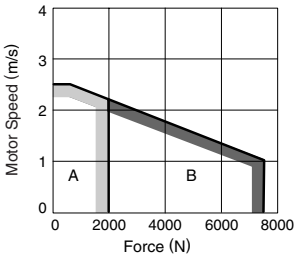
SGLTW-40A600B



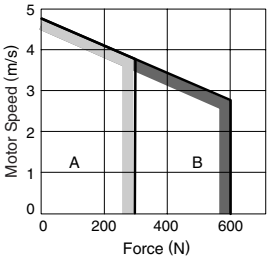
SGLTW-80A400B



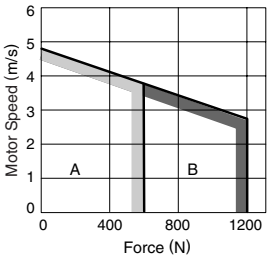
SGLTW-80A600B



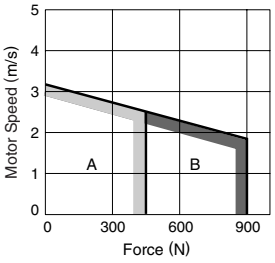
SGLTW-35A170H



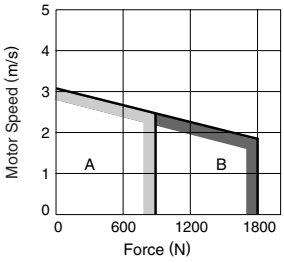
SGLTW-35A320H



SGLTW-50A170H



SGLTW-50A320H



● Mechanical Specifications

(1) Impact Resistance

- Impact acceleration: 196 m/s^2
- Impact occurrences: twice

(2) Vibration Resistance

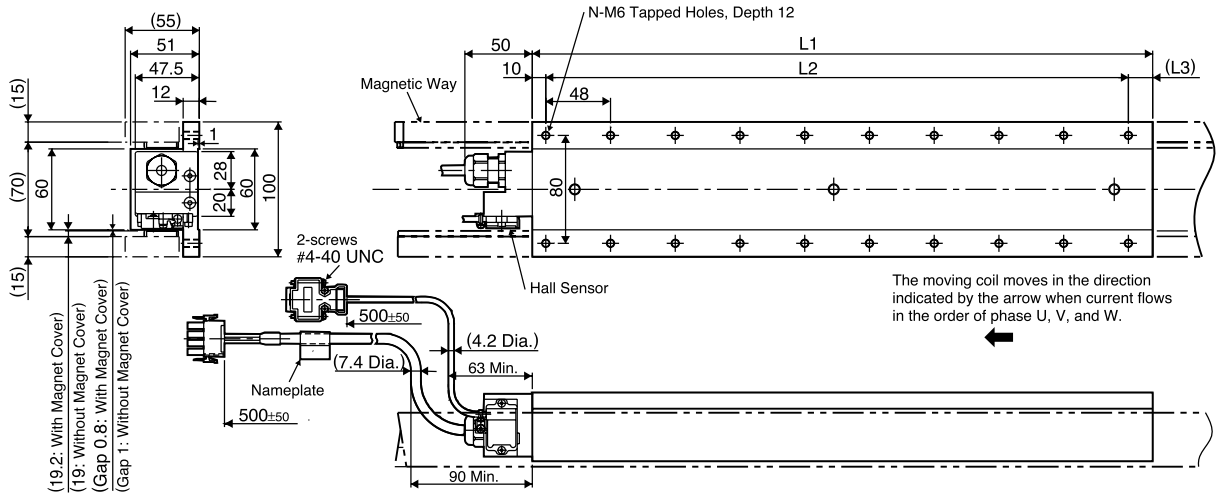
The linear servomotors will withstand the following vibration acceleration in three directions: Vertical, side to side, and front to back

- Vibration acceleration: 49 m/s^2

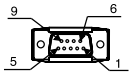
External Dimensions Units: mm

• SGLT□-20 Linear Servomotors

(1) Moving Coil: SGLTW-20A□□□A□ (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor Connector Specifications



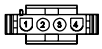
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5 VDC
2	Phase U
3	Phase V
4	Phase W
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin : 350218-3 or
350547-3 (No.1 to 3)
350654-1
350669-1 (No.4)
by Tyco Electronics AMP K.K.

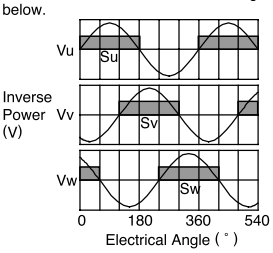
The Mating Connector

Cap : 350780-1
Socket: 350536-3 or
350550-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Black
4	Ground	Green

Hall Sensor Output Signals

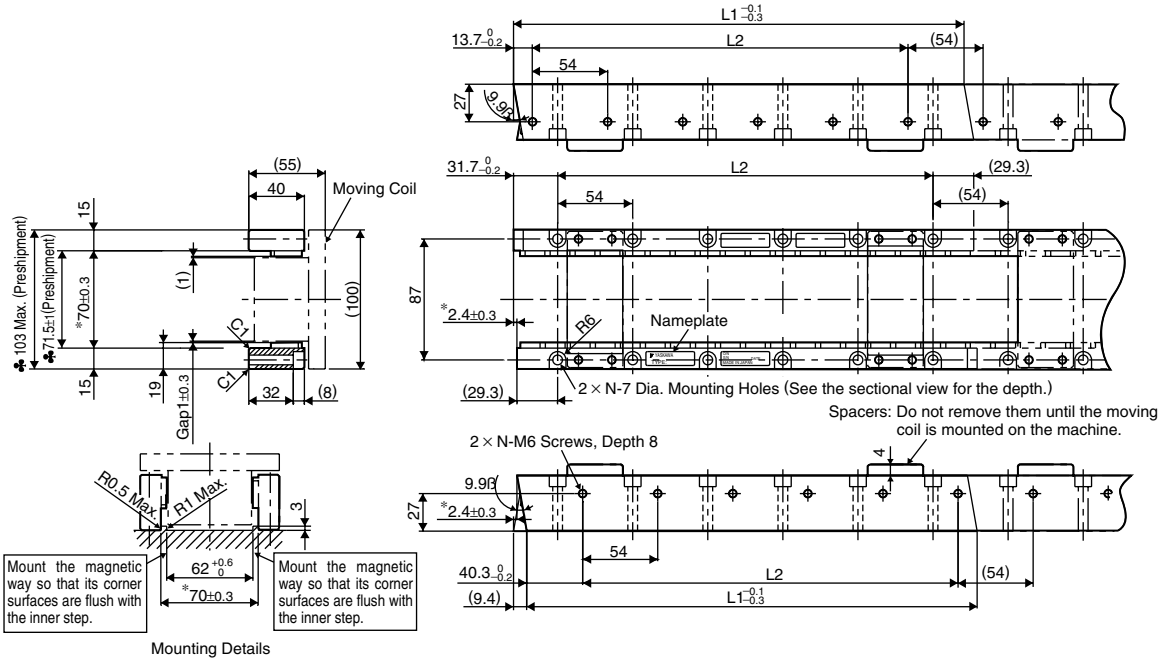
When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Moving Coil Model SGLTW-	L1	L2	(L3)	N	Approx. Mass kg
20A170A□	170	144 (48×3)	(16)	8	2.5
20A320A□	315	288 (48×6)	(17)	14	4.6
20A460A□	460	432 (48×9)	(18)	20	6.7

External Dimensions Units: mm

(2) Magnetic Way: SGLTM-20□□□A□



Mounting Details

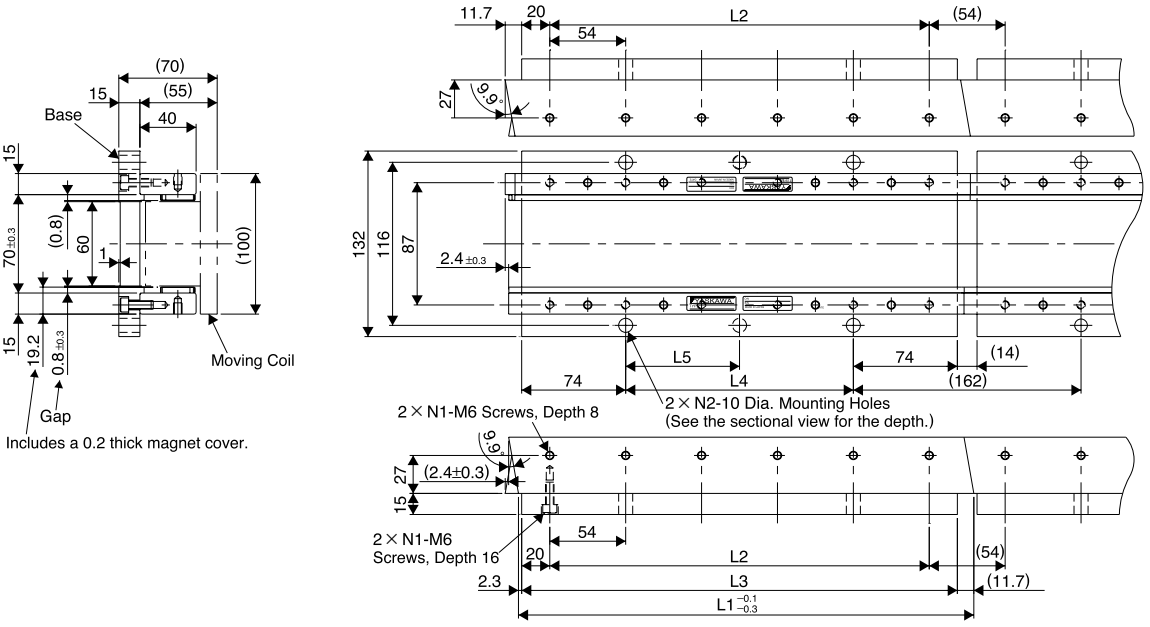
Notes: 1 Two magnetic ways for both ends of moving coil make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the moving coil is mounted on a machine.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
3 Two magnetic ways in a set can be connected to each other.
4 The dimensions marked with an ✻ are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an ♣ are the dimensions at preshipment.
5 Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.

Magnetic Way Model SGLTM-	L1 −0.1 −0.3	L2	N	Approx. Mass kg
20324A□	324	270 (54×5)	6	3.4
20540A□	540	486 (54×9)	10	5.7
20756A□	756	702 (54×13)	14	7.9

External Dimensions Units: mm

• SGLT□-20 Linear Servomotors

(3) Magnetic Way with Base: SGLTM-20□□□AY



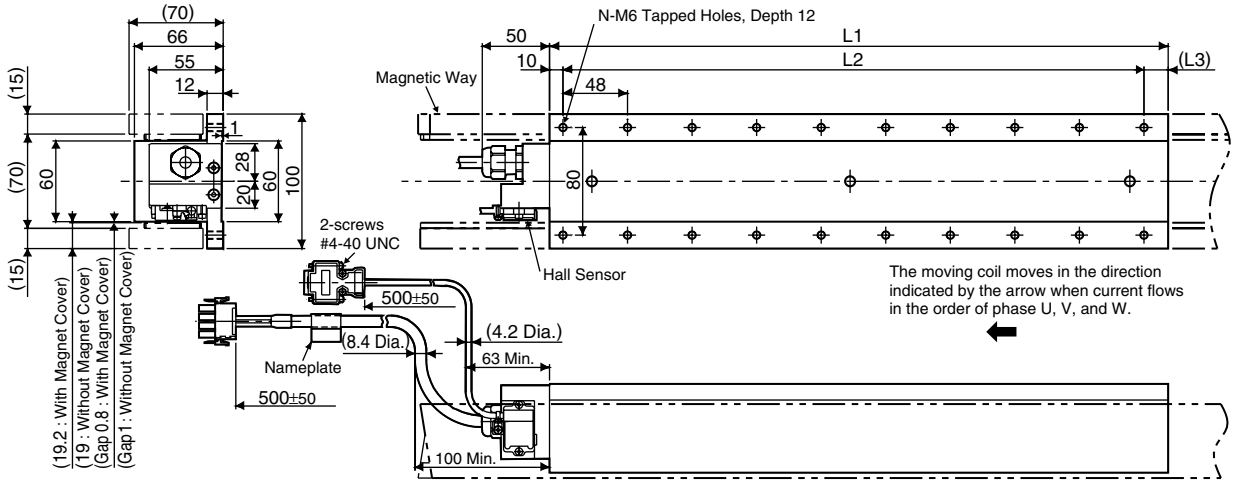
Notes: 1 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
2 Two magnetic ways in a set can be connected to each other.
3 The characteristics of the magnetic way with base are the same as of the magnetic way without base (SGLTM-20□□□A).

Magnetic Way Model SGLTM-	L1	L2	L3	L4	L5	N1	N2	Approx. Mass kg
20324AY	324	270	310	162	162	6	2	5.1
20540AY	540	486	526	378	189	10	3	8.5
20756AY	756	702	742	594	198	14	4	12

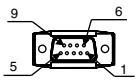
External Dimensions Units: mm

- SGLT□-35A□□□A□ Linear Servomotors

(1) Moving Coil: SGLTW-35A□□□A□ (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor
Connector Specifications



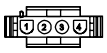
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5 VDC
2	Phase U
3	Phase V
4	Phase W
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications



Plug: 350779-1
Pin : 350218-3 or
350547-3 (No.1 to 3)
350654-1
350669-1 (No.4)
by Tyco Electronics AMP K.K.

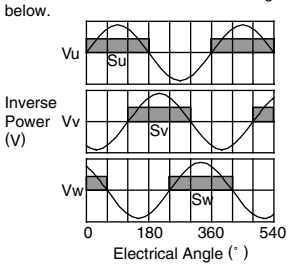
The Mating Connector

Cap : 350780-1
Socket: 350536-3 or
350550-3

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Black
4	Ground	Green

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.

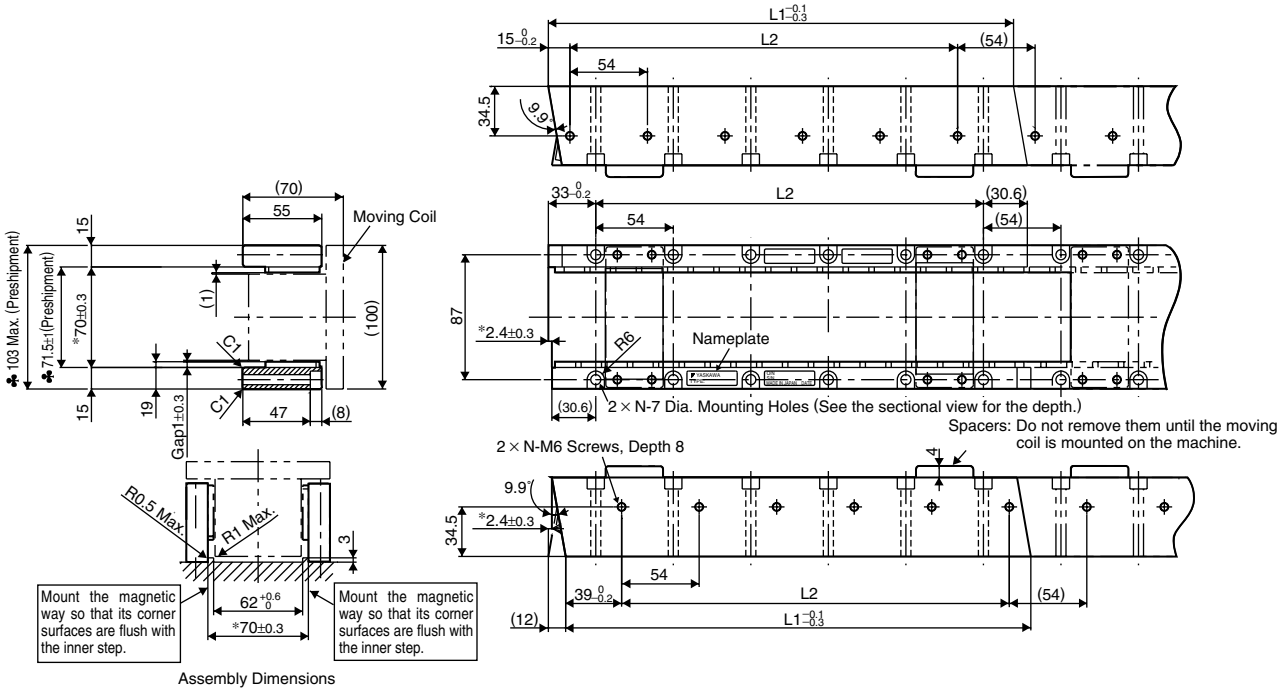


Moving Coil Model SGLTW-	L1	L2	(L3)	N	Approx. Mass kg
35A170A□	170	144 (48×3)	(16)	8	3.7
35A320A□	315	288 (48×6)	(17)	14	6.8
35A460A□	460	432 (48×9)	(18)	20	10

External Dimensions Units: mm

- SGLT□-35A□□□A□ Linear Servomotors

(2) Magnetic Way: SGLTM-35□□□A□

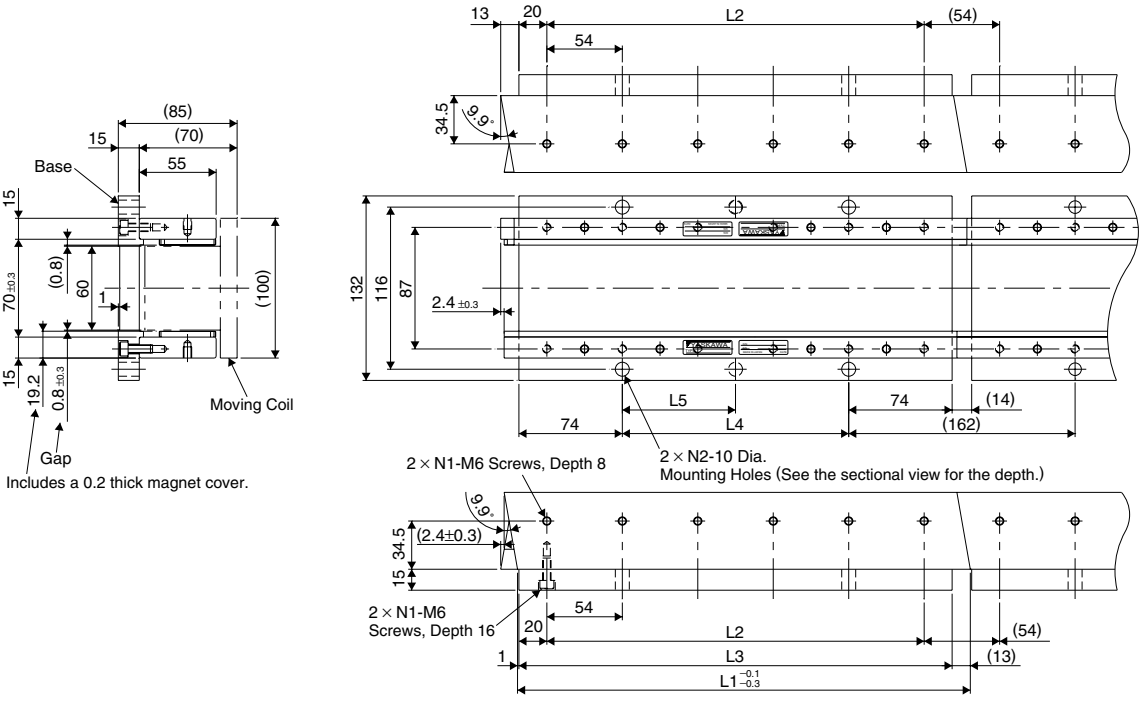


Notes: 1 Two magnetic ways for both ends of moving coil make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the moving coil is mounted on a machine.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
3 Two magnetic ways in a set can be connected to each other.
4 The dimensions marked with an ✻ are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an ♣ are the dimensions at preshipment.
5 Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.

Magnetic Way Model SGLTM-	$L1^{-0.1}_{-0.3}$	L2	N	Approx. Mass kg
35324A□	324	270 (54×5)	6	4.8
35540A□	540	486 (54×9)	10	8
35756A□	756	702 (54×13)	14	11

External Dimensions Units: mm

(3) Magnetic Way with Base: SGLTM-35□□□AY



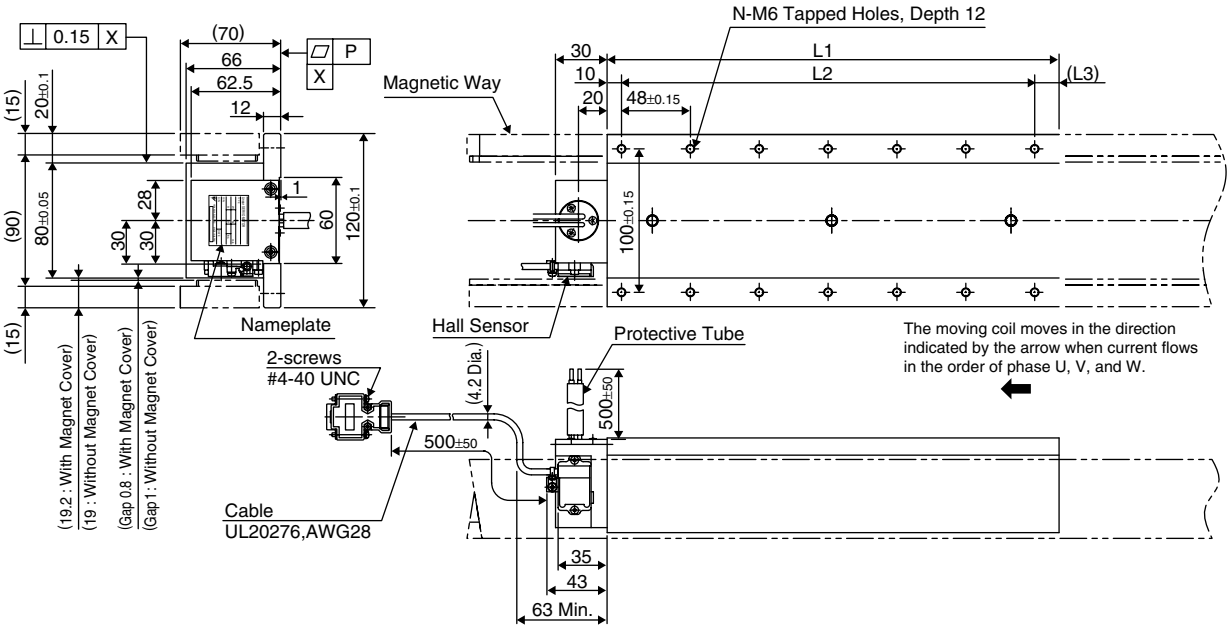
Notes: 1 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
2 Two magnetic ways in a set can be connected to each other.
3 The characteristics of the magnetic way with base are the same as of the magnetic way without base (SGLTM-35□□□A).

Magnetic Way Model SGLTM-	L1	L2	L3	L4	L5	N1	N2	Approx. Mass kg
35324AY	324	270	310	162	162	6	2	6.4
35540AY	540	486	526	378	189	10	3	11
35756AY	756	702	742	594	198	14	4	15

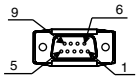
External Dimensions Units: mm

- SGLT□-35A□□□H□ Linear Servomotors

(1) Moving Coil: SGLTW-35A□□□H□ (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor
Connector Specifications



Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

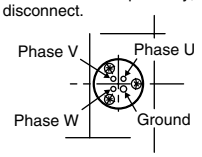
The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5 VDC
2	Phase U
3	Phase V
4	Phase W
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used

Lead Specifications of Moving Coil

• If this cable is bent repetitively, the cable will disconnect.

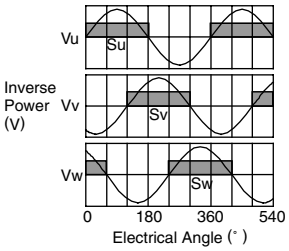


(View from Top of Moving Coil)

Name	Color	Code	Wire Size
Phase U	Black	U	2 mm²
Phase V		V	
Phase W		W	
Ground	Green	–	2 mm²

Hall Sensor Output Signals

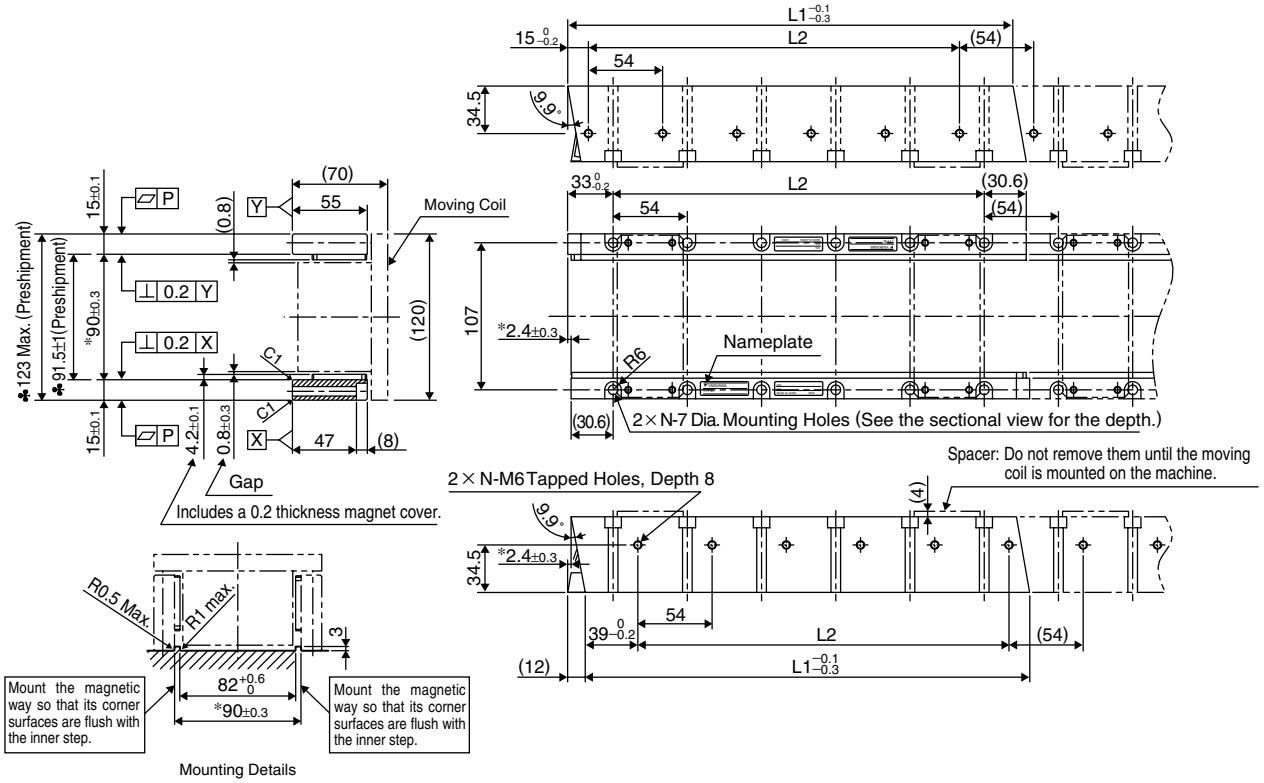
When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Moving Coil Model SGLTW-	L1	L2	(L3)	N	Approx. Mass kg
35A170H□	170	144 (48×3)	(16)	8	4.7
35A320H□	315	288 (48×6)	(17)	14	8.8

External Dimensions Units: mm

(2) Magnetic Way: SGLTM-35□□□H□



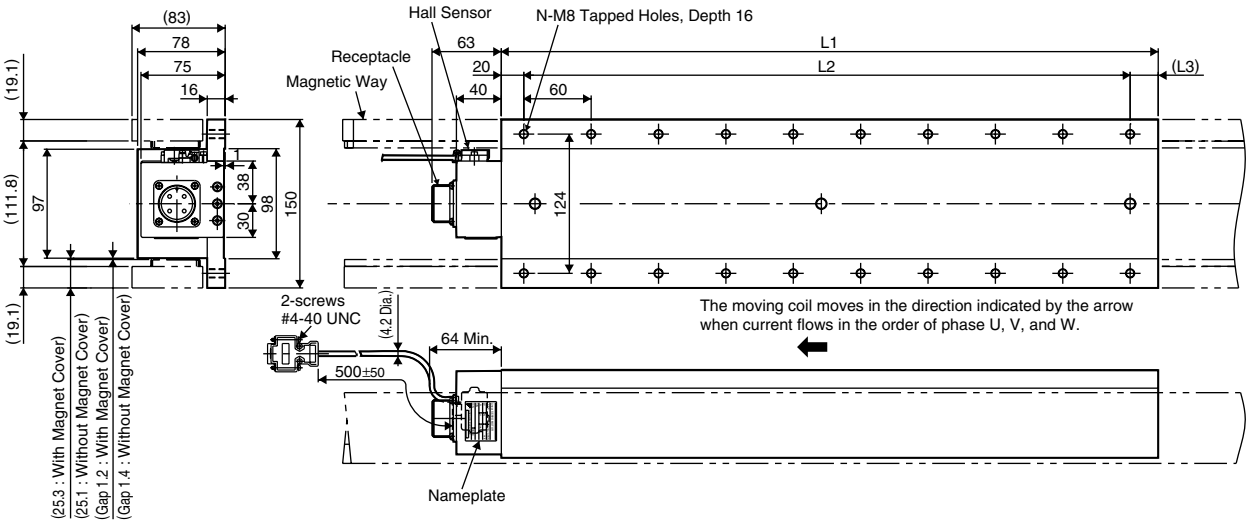
Notes: 1 Two magnetic ways for both ends of moving coil make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the moving coil is mounted on a machine.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
3 Two magnetic ways in a set can be connected to each other.
4 The dimensions marked with an ✻ are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an ♣ are the dimensions at preshipment.
5 Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.

Magnetic Way Model SGLTM-	$L1^{-0.1}_{-0.3}$	L2	N	Approx. Mass kg
35324H□	324	270 (54×5)	6	4.8
35540H□	540	486 (54×9)	10	8
35756H□	756	702 (54×13)	14	11

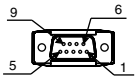
External Dimensions Units: mm

- SGLT□-40 Linear Servomotors

(1) Moving Coil: SGLTW-40A□□□B□ (With an MS connector)



Hall Sensor Connector Specifications



Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5 VDC (power supply)
2	Phase U
3	Phase V
4	Phase W
5	0 V (power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications

Receptacle: MS3102A-22-22P
by DDK Ltd.

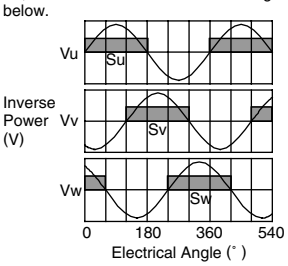
The Mating Connector

L-shaped plug: MS3108B22-22S
Straight plug : MS3106B22-22S
Cable clamp : MS3057-12A

Pin No.	Name
A	Phase U
B	Phase V
C	Phase W
D	Ground

Hall Sensor Output Signals

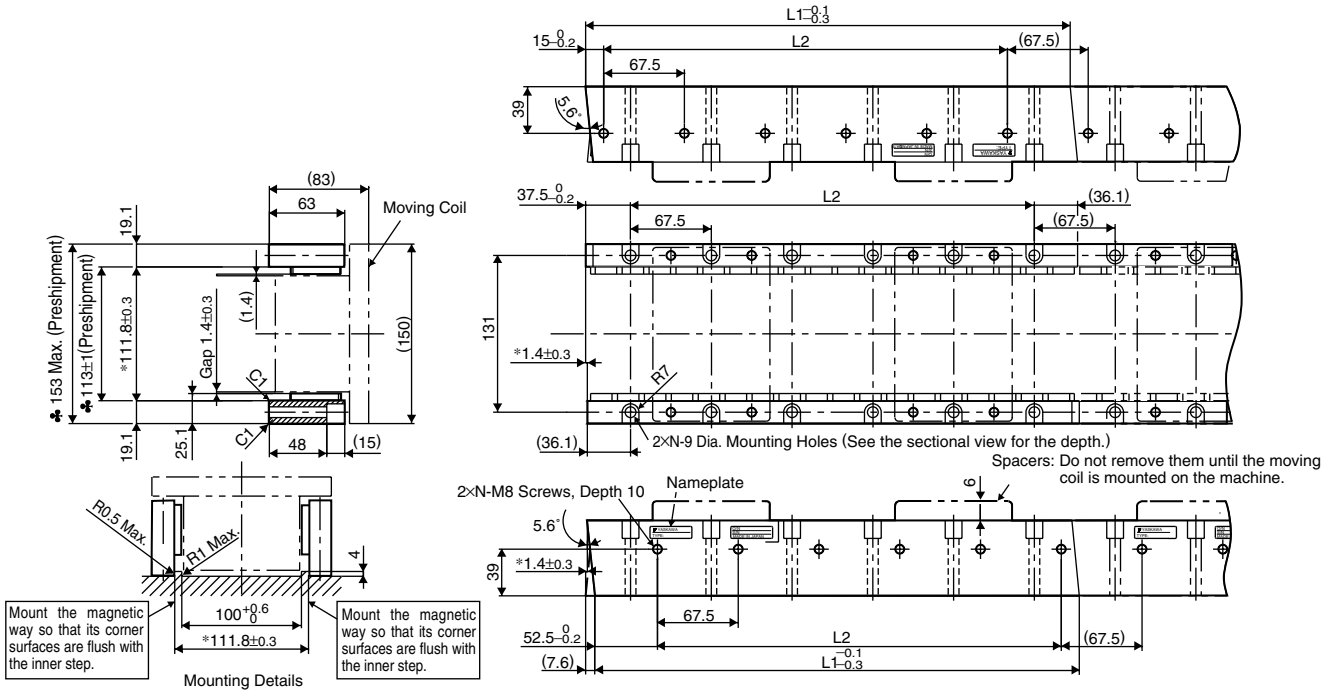
When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



Moving Coil Model SGLTW-	L1	L2	(L3)	N	Approx. Mass kg
40A400B□	395	360 (60×6)	(15)	14	15
40A600B□	575	540 (60×9)	(15)	20	22

External Dimensions Units: mm

(2) Magnetic Way: SGLTM-40□□□A□



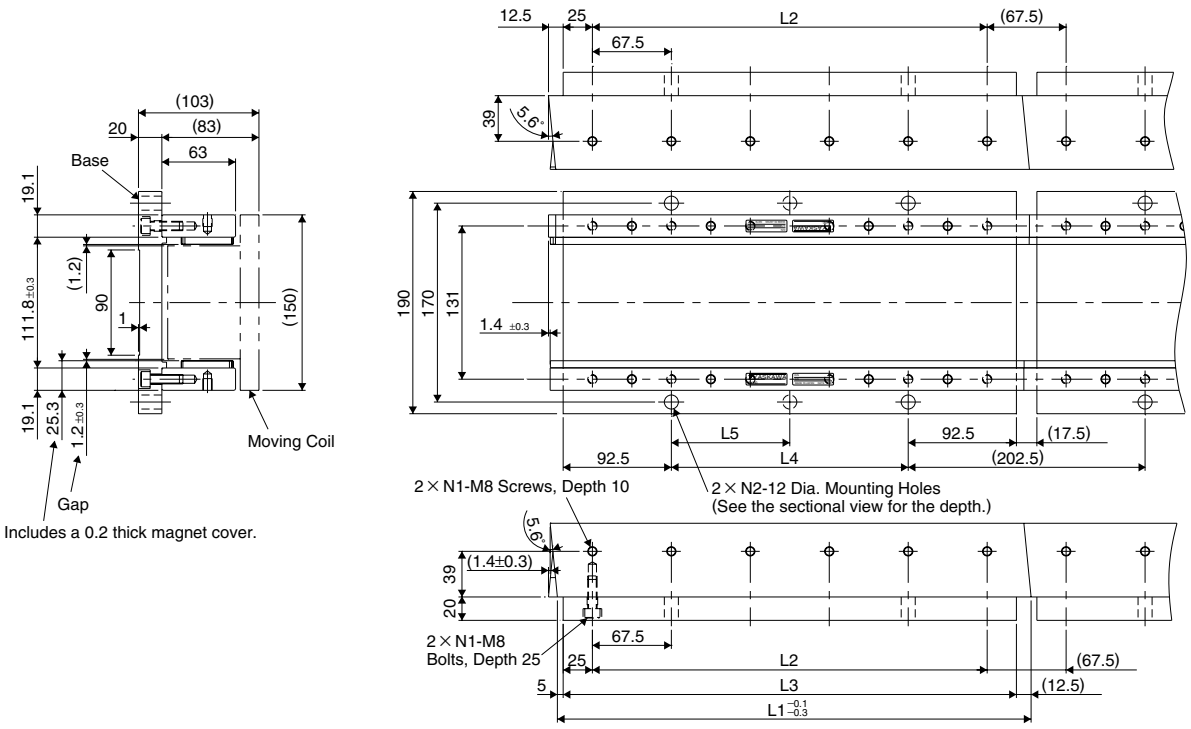
Notes: 1 Two magnetic ways for both ends of moving coil make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the moving coil is mounted on a machine.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
3 Two magnetic ways in a set can be connected to each other.
4 The dimensions marked with an ✻ are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an ♣ are the dimensions at preshipment.
5 Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.

Magnetic Way Model SGLTM-	L1 −0.1 −0.3	L2	N	Approx. Mass kg
40405A□	405	337.5 (67.5×5)	6	9
40675A□	675	607.5 (67.5×9)	10	15
40945A□	945	877.5 (67.5×13)	14	21

External Dimensions Units: mm

- SGLT□-40 Linear Servomotors

(3) Magnetic Way with Base: SGLTM-40□□□AY



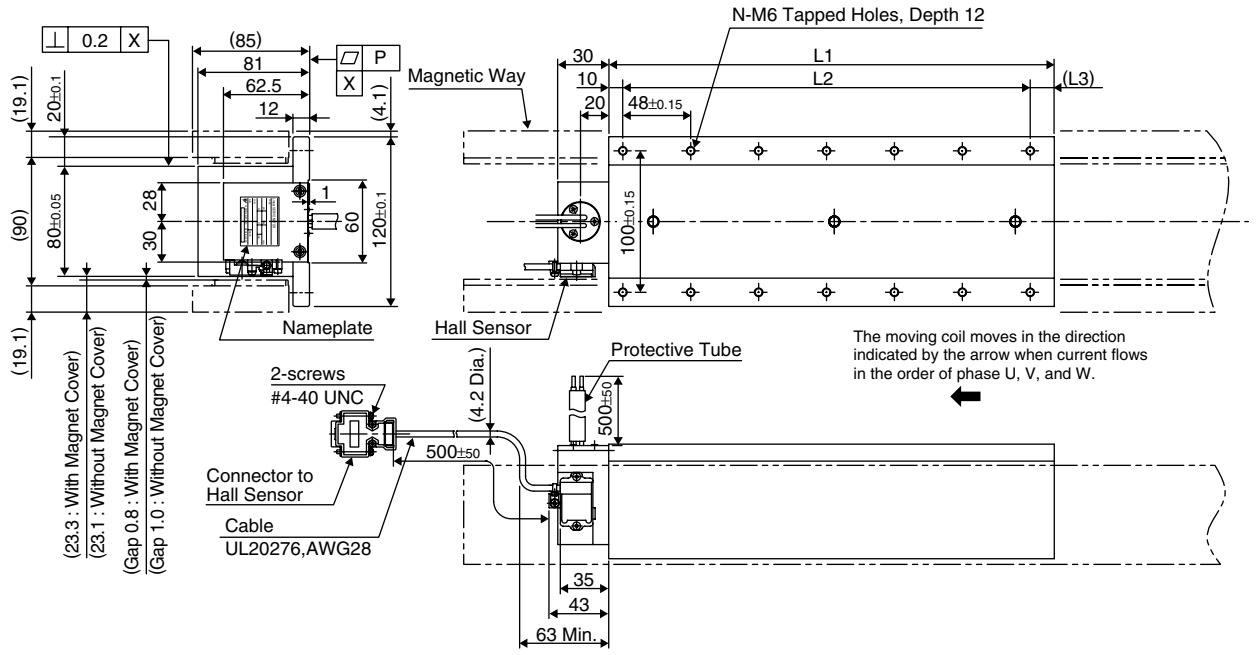
Notes: 1 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
2 Two magnetic ways in a set can be connected to each other.
3 The characteristics of the magnetic way with base are the same as of the magnetic way without base (SGLTM-40□□□A).

Magnetic Way Model SGLTM-	L1	L2	L3	L4	L5	N1	N2	Approx. Mass kg
40405AY	405	337.5	387.5	202.5	202.5	6	2	13
40675AY	675	607.5	657.5	472.5	236.25	10	3	21
40945AY	945	877.5	927.5	742.5	247.5	14	4	30

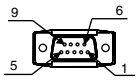
External Dimensions Units: mm

- SGLT□-50 Linear Servomotors

(1) Moving Coil: SGLTW-50A□□□H□ (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor
Connector Specifications



Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

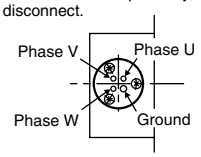
The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5 VDC
2	Phase U
3	Phase V
4	Phase W
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used

Lead Specifications of Moving Coil

• If this cable is bent repetitively, the cable will disconnect.

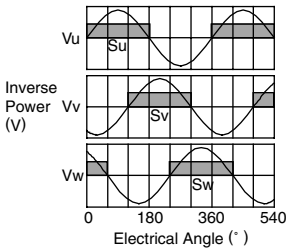


(View from Top of Moving Coil)

Name	Color	Code	Wire Size
Phase U	Black	U	2 mm²
Phase V		V	
Phase W		W	
Ground	Green	–	2 mm²

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.

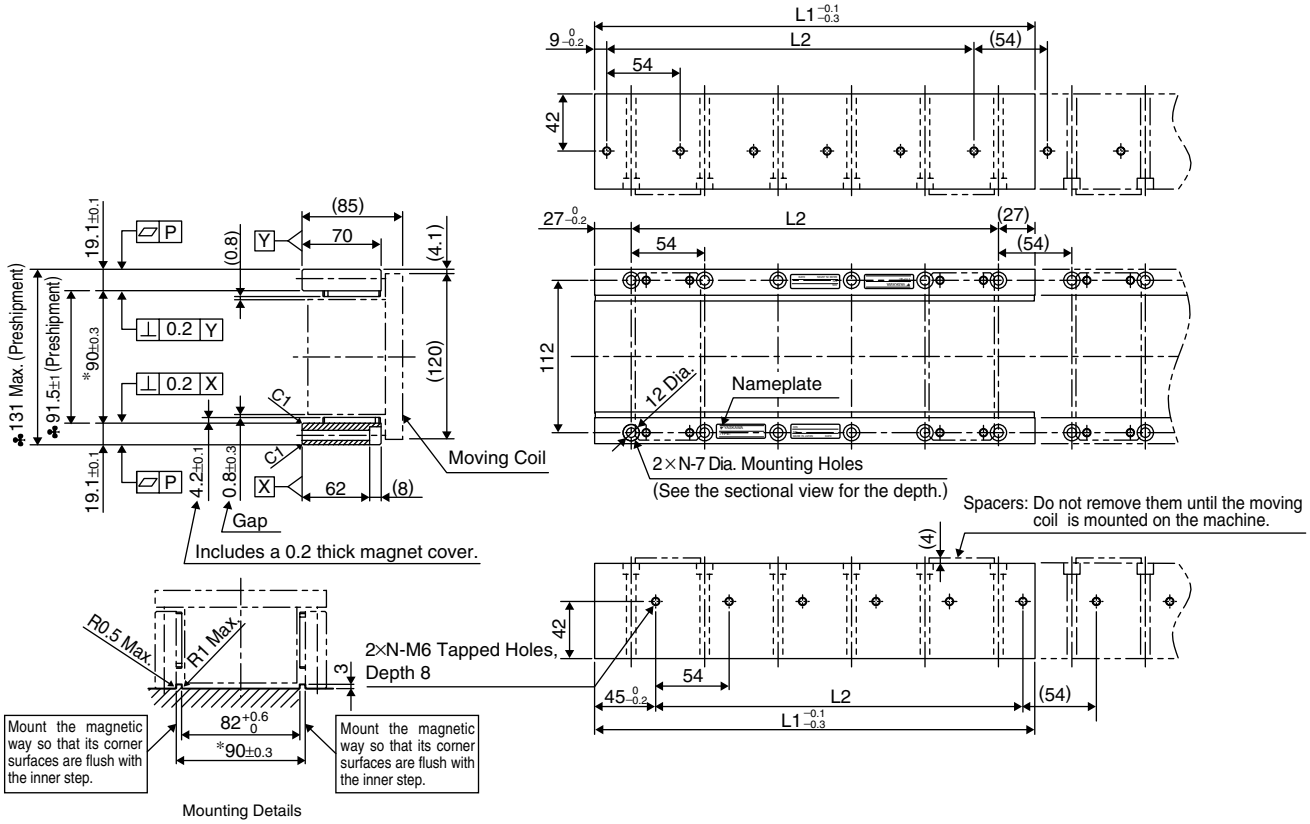


Moving Coil Model SGLTW-	L1	L2	(L3)	N	Approx. Mass kg
50A170H□	170	144 (48×3)	(16)	8	6
50A320H□	315	288 (48×6)	(17)	14	11

External Dimensions Units: mm

• SGLT□-50 Linear Sarvomotors

(2) Magnetic Way: SGLTM-50□□□H□



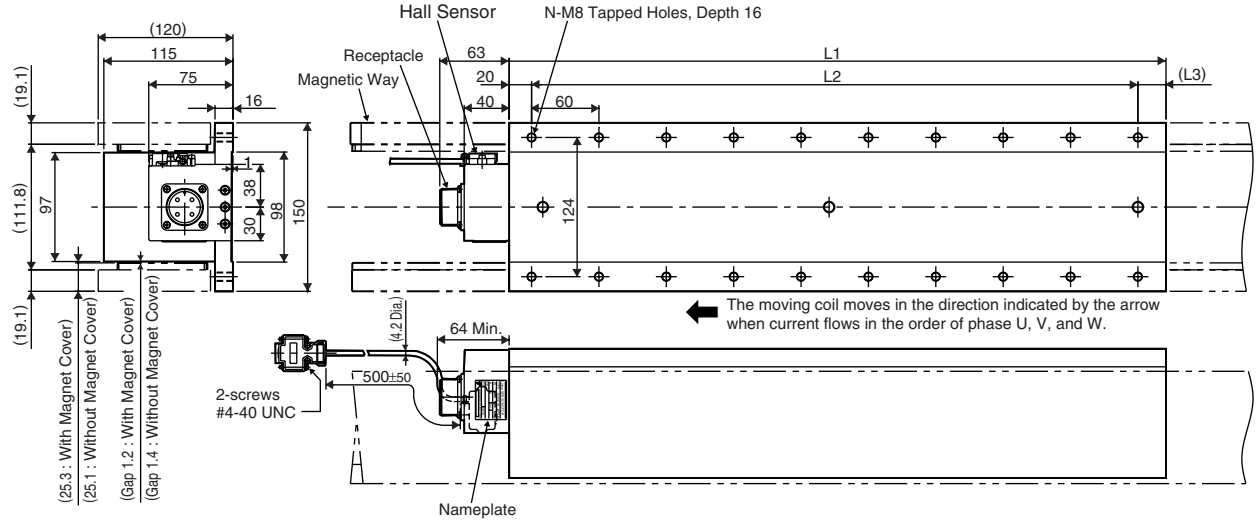
Notes: 1 Two magnetic ways for both ends of moving coil make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the moving coil is mounted on a machine.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
3 Two magnetic ways in a set can be connected to each other.
4 The dimensions marked with an ✻ are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an ♣ are the dimensions at preshipment.
5 Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.

Magnetic Way Model SGLTM-	$L1^{-0.1}_{-0.3}$	L2	N	Approx. Mass kg
50324H□	324	270 (54×5)	6	8
50540H□	540	486 (54×9)	10	13
50756H□	756	702 (54×13)	14	18

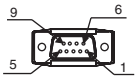
External Dimensions Units: mm

- SGLT□-80 Linear Servomotors

(1) Moving Coil: SGLTW-80A□□□B□ (With an MS connector)



Hall Sensor
Connector Specifications



Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5 VDC
2	Phase U
3	Phase V
4	Phase W
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor
Connector Specifications

Receptacle: MS3102A-22-22P
by DDK Ltd.

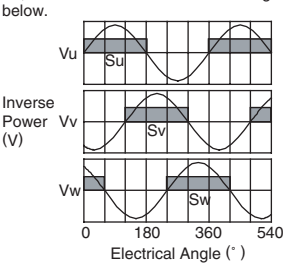
The Mating Connector

L-shaped plug: MS3108B22-22S
Straight plug : MS3106B22-22S
Cable clamp : MS3057-12A

Pin No.	Name
A	Phase U
B	Phase V
C	Phase W
D	Ground

Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.

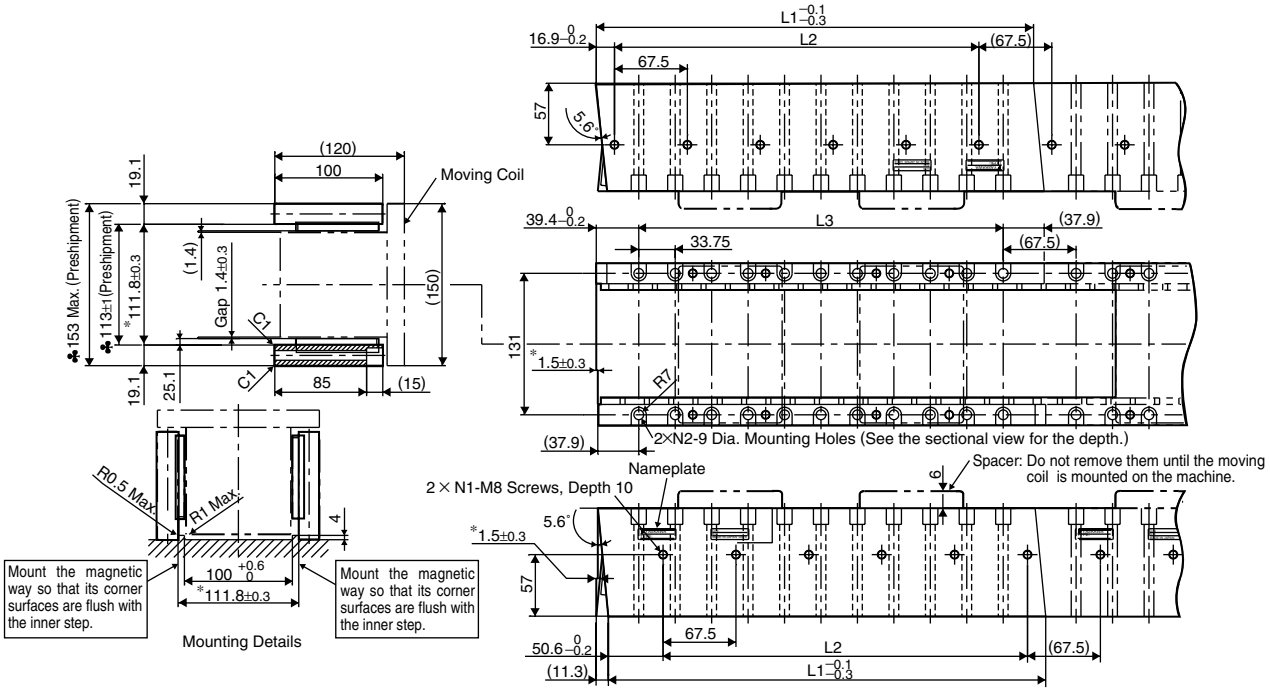


Moving Coil Model SGLTW-	L1	L2	(L3)	N	Approx. Mass kg
80A400B□	394.2	360 (60×6)	(14.2)	14	24
80A600B□	574.2	540 (60×9)	(14.2)	20	35

External Dimensions Units: mm

- SGLT□-80 Linear Servomotors

(2) Magnetic Way: SGLTM-80□□□A□

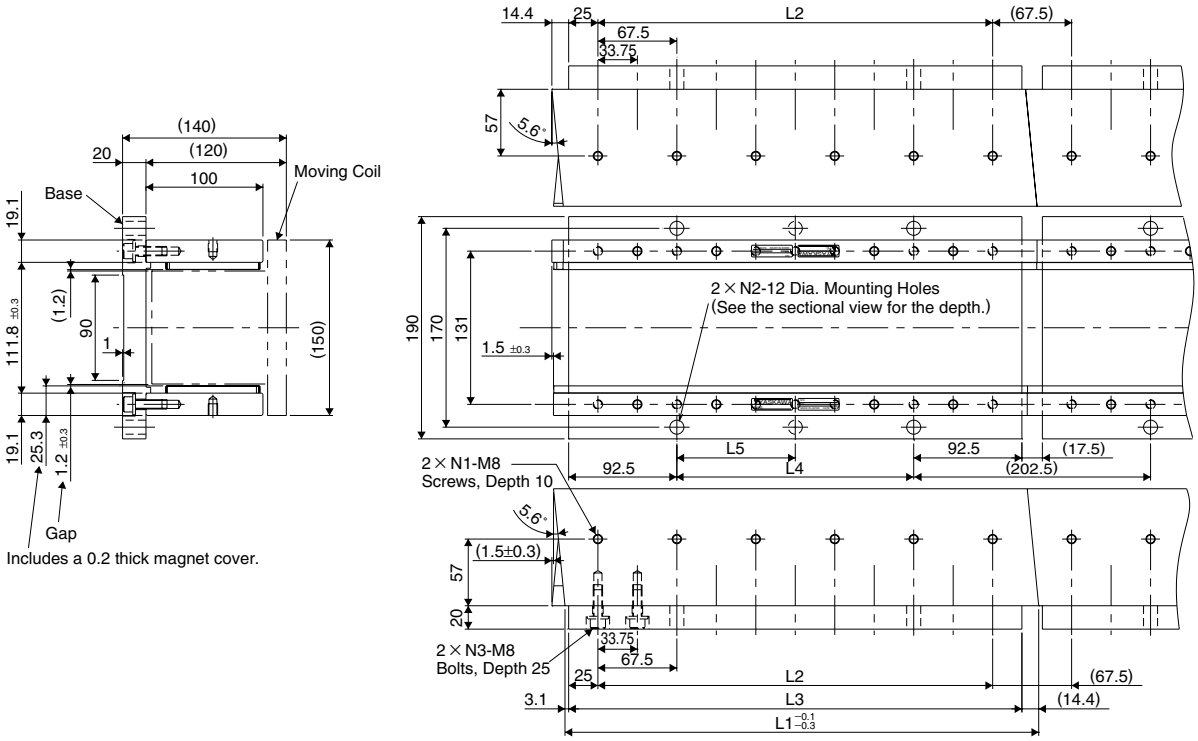


Notes: 1 Two magnetic ways for both ends of moving coil make one set. Spacers are mounted on magnetic ways for safety during transportation. Do not remove the spacers until the moving coil is mounted on a machine.
2 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
3 Two magnetic ways in a set can be connected to each other.
4 The dimensions marked with an ✻ are the dimensions between the magnetic ways. Be sure to follow exactly the dimensions specified in the figure above. Mount magnetic ways as shown in Assembly Dimensions. The values with an ♣ are the dimensions at preshipment.
5 Use socket headed screws of strength class 10.9 minimum for magnetic way mounting screws. Do not use stainless steel screws.

Magnetic Way Model SGLTM-	$L1^{-0.1}_{-0.3}$	L2	L3	N1	N2	Approx. Mass kg
80405A□	405	337.5 (67.5×5)	337.5 (33.75×10)	6	11	14
80675A□	675	607.5 (67.5×9)	607.5 (33.75×18)	10	19	24
80945A□	945	877.5 (67.5×13)	877.5 (33.75×26)	14	27	34

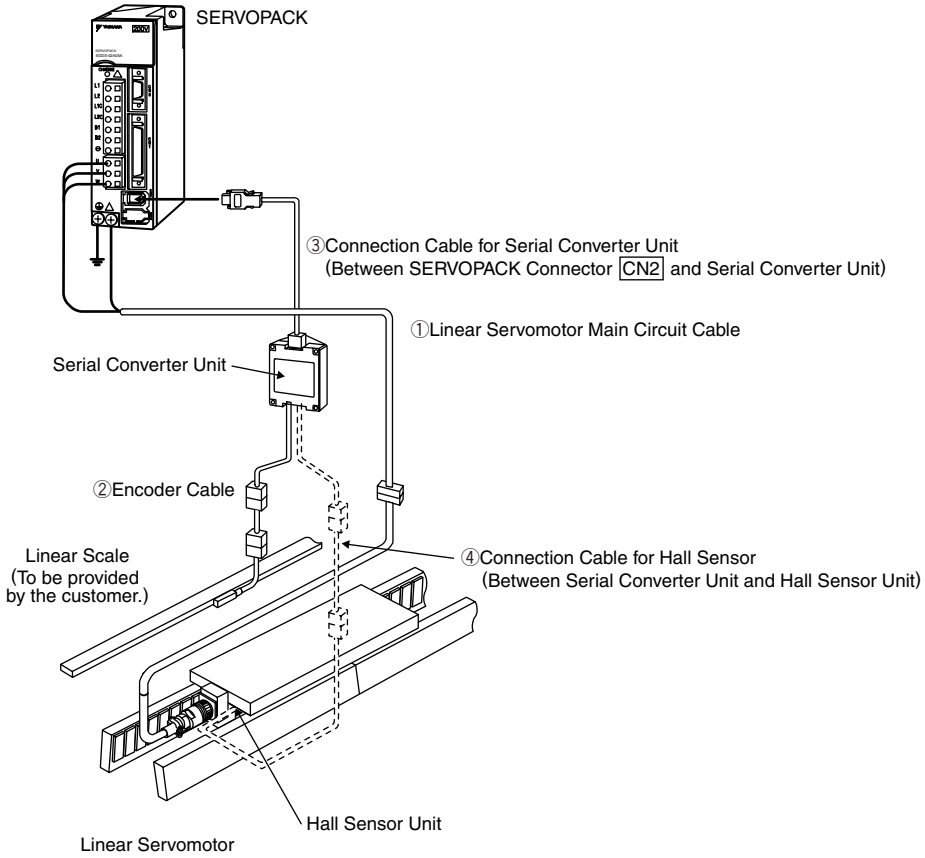
External Dimensions Units: mm

(3) Magnetic Way with Base: SGLTM-80□□□AY

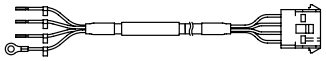
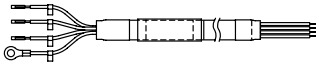
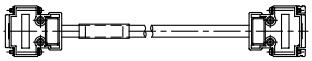
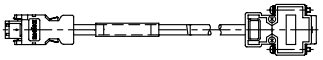
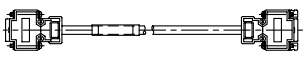


Notes: 1 If you have a pacemaker or any other electric medical device, do not go near the magnetic way of the linear servomotor.
2 Two magnetic ways in a set can be connected to each other.
3 The characteristics of the magnetic way with base are the same as of the magnetic way without base (model SGLTM-80□□□A).

Magnetic Way Model SGLTM-	L1	L2	L3	L4	L5	N1	N2	N3	Approx. Mass kg
80405AY	405	337.5	387.5	202.5	202.5	6	2	11	18
80675AY	675	607.5	657.5	472.5	236.25	10	3	19	31
80945AY	945	877.5	927.5	742.5	247.5	14	4	27	43

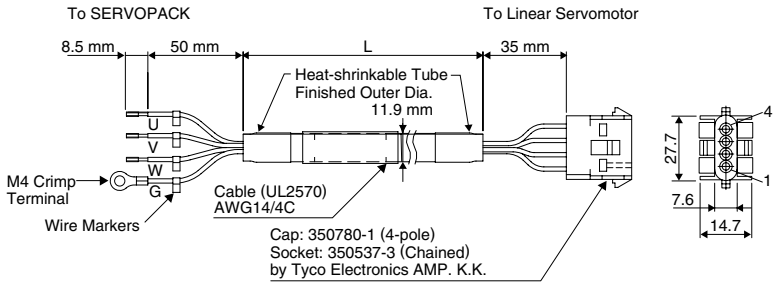

SERVOPACK
③Connection Cable for Serial Converter Unit
(Between SERVOPACK Connector CN2 and Serial Converter Unit)
①Linear Servomotor Main Circuit Cable
Serial Converter Unit
②Encoder Cable
Linear Scale
(To be provided
by the customer.)
④Connection Cable for Hall Sensor
(Between Serial Converter Unit and Hall Sensor Unit)
Hall Sensor Unit
Linear Servomotor

Selecting Cables

Name	Applicable Linear Servomotor Model	Length	Order No.	Specifications	Details
① Linear Servomotor Main Circuit Cables	SGLTW -20, -35	1 m	JZSP-CLN21-01-E	To SERVOPACK To Linear Servomotor 	(1)
		3 m	JZSP-CLN21-03-E		
		5 m	JZSP-CLN21-05-E		
		10 m	JZSP-CLN21-10-E		
		15 m	JZSP-CLN21-15-E		
		20 m	JZSP-CLN21-20-E		
	SGLTW-40, -50, -80	1 m	JZSP-CLN39-01-E	(Note) To SERVOPACK To Linear Servomotor 	(2)
		3 m	JZSP-CLN39-03-E		
		5 m	JZSP-CLN39-05-E		
		10 m	JZSP-CLN39-10-E		
		15 m	JZSP-CLN39-15-E		
		20 m	JZSP-CLN39-20-E		
② Encoder Cables	All models	1 m	JZSP-CLL00-01-E	To Serial Converter Unit To Linear Scale 	(3)
		3 m	JZSP-CLL00-03-E		
		5 m	JZSP-CLL00-05-E		
		10 m	JZSP-CLL00-10-E		
		15 m	JZSP-CLL00-15-E		
③ Connection Cables for Serial Converter Unit	All models	1 m	JZSP-CLP70-01-E	To SERVOPACK To Serial Converter Unit 	(4)
		3 m	JZSP-CLP70-03-E		
		5 m	JZSP-CLP70-05-E		
		10 m	JZSP-CLP70-10-E		
		15 m	JZSP-CLP70-15-E		
		20 m	JZSP-CLP70-20-E		
④ Connection Cables for Hall Sensor	All models	1 m	JZSP-CLL10-01-E	To Serial Converter Unit To Hall Sensor Unit 	(5)
		3 m	JZSP-CLL10-03-E		
		5 m	JZSP-CLL10-05-E		
		10 m	JZSP-CLL10-10-E		
		15 m	JZSP-CLL10-15-E		

Note: A connector is not provided on the linear-servomotor end of the main circuit cable (JZSP-CLN39-□□-E).

(1) Linear Servomotor Main Circuit Cable: JZSP-CLN21-□□-E



• Wiring Specifications

Leads to SERVOPACK

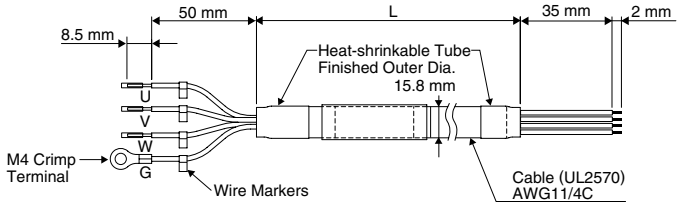
Lead Color	Signal
Red	Phase U
White	Phase V
Blue	Phase W
Green/Yellow	FG

Connector to Linear Servomotor

Signal	Pin No.
Phase U	1
Phase V	2
Phase W	3
FG	4

(2) Linear Servomotor Main Circuit Cable: JZSP-CLN39-□□-E

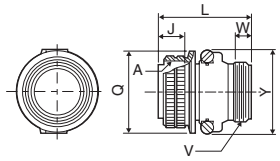
A connector is not provided on the linear-servomotor end of the main circuit cable (JZSP-CLN39-□□-E).



● JZSP-CLN39 Cable Connectors

Applicable Linear Servomotor Model	Attached Connector	Plug		Cable Clamp
		Straight	L-shaped	
SGLTW-40	MS3102A22-22P	MS3106B22-22S or MS3106A22-22S	MS3108B22-22S	MS3057-12A

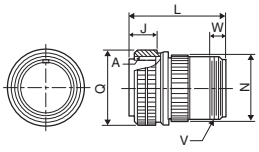
MS3106B: Straight Plug with Front-shell and Back-shell Separated



Units: mm

Shell Size	Joint Screw A	Joint Length J±0.12	Max. Overall Length L	Outer Diameter of Nut Q $^{+0}_{-0.38}$	Cable Clamp Mounting Screw V	Min. Effective Screw Length W	Max. Width Y
22	1 3/8-18UNEF	18.26	55.57	40.48	1 3/16-18UNEF	9.53	50

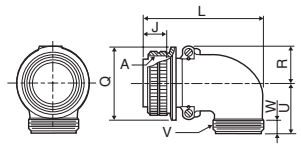
MS3106A: Straight Plug with Solid Shell



Units: mm

Shell Size	Joint Screw A	Joint Length J±0.12	Overall Length ±0.5 L	Outer Diameter of Nut Q $^{+0}_{-0.38}$	Outer Diameter N±0.5	Cable Clamp Mounting Screw V	Min. Effective Screw Length W
22	1 3/8-18UNEF	18.26	54	40.48	34.99	1 3/16-18UNEF	9.53

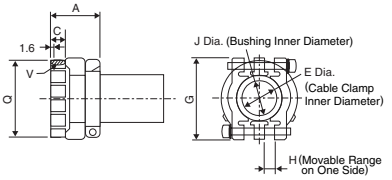
MS3108B: L-shaped Plug with Front-shell and Back-shell Separated



Units: mm

Shell Size	Joint Screw A	Joint Length J±0.12	Max. Overall Length L	Outer Diameter of Nut Q $^{+0}_{-0.38}$	R ±0.5	U ±0.5	Cable Clamp Mounting Screw V	Min. Effective Screw Length W
22	1 3/8-18UNEF	18.26	76.98	40.48	24.1	33.3	1 3/16-18UNEF	9.53

MS3057A-12: Cable Clamp with Rubber Bushing

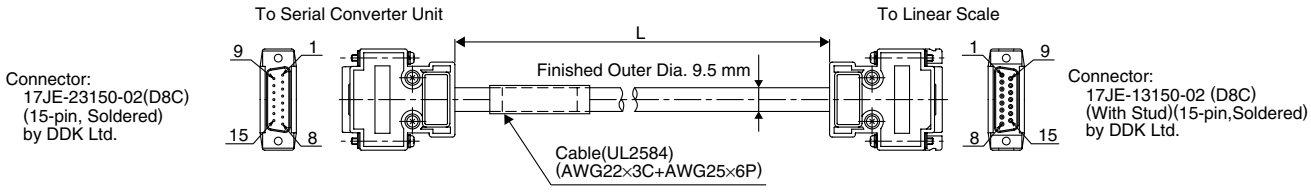


Units: mm

Applicable Shell Size	Overall Length A±0.7	Effective Screw Length C	E	G±0.7	H	J	Mounting Screw V	Outer Diameter Q±0.7	Rubber Bushing Type
20, 22	23.8	10.3	19.0	37.3	4.0	15.9	1 3/16-18UNEF	35.0	AN3420-12

Selecting Cables

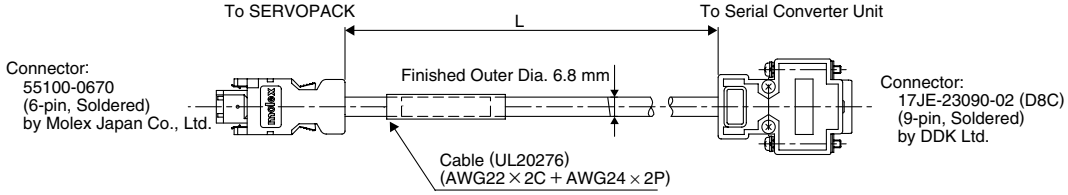
(3) Encoder Cable: JZSP-CLL00-□□-E



・Wiring Specifications

To Serial Converter Unit		To Linear Scale	
Pin No	Signal	Pin No.	Signal
1	/Cos (V1–)	1	/Cos (V1–)
2	/Sin (V2–)	2	/Sin (V2–)
3	Ref (V0+)	3	Ref (V0+)
4	+5 V	4	+5 V
5	5 Vs	5	5 Vs
6	BID	6	BID
7	Vx	7	Vx
8	Vq	8	Vq
9	Cos (V1+)	9	Cos (V1+)
10	Sin (V2+)	10	Sin (V2+)
11	/Ref (V0–)	11	/Ref (V0–)
12	0 V	12	0 V
13	0 Vs	13	0 Vs
14	DIR	14	DIR
15	Inner	15	Inner
Case	Shield	Case	Shield

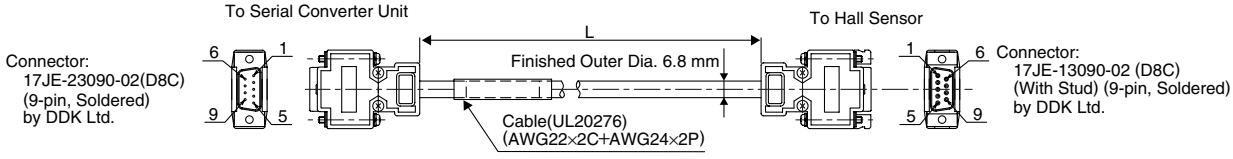
(4) Connection Cable for Serial Converter Unit: JZSP-CLP70-□□-E



・Wiring Specifications

To SERVOPACK			To Serial Converter Unit		
Pin No.	Signal	Lead Color	Pin No.	Signal	Lead Color
1	PG5V	Red	1	+5 V	Red
2	PG0V	Black	5	0 V	Black
3	–	–	3	–	–
4	–	–	4	–	–
5	PS	Light blue	2	Phase S output	Light blue
6	/PS	Light blue/white	6	Phase /S output	Light blue/white
Shell	Shield	–	Case	Shield	–
			7	–	–
			8	–	–
			9	–	–

(5) Connection Cable for Hall Sensor: JZSP-CLL10-□□-E



・Wiring Specifications

To Serial Converter Unit		To Hall Sensor	
Pin No.	Signal	Pin No.	Signal
1	+5 V	1	+5 V
2	Phase U input	2	Phase U input
3	Phase V input	3	Phase V input
4	Phase W input	4	Phase W input
5	0 V	5	0 V
6	–	6	–
7	–	7	–
8	–	8	–
9	–	9	–
Case	Shield	Case	Shield

Serial Converter Unit

● Characteristics and Specifications

Items		Specifications
Electrical Characteristics	Power Supply Voltage	+5.0 V±5%, ripple content 5% max.
	Current Consumption*1	120 mA typ. 350 mA max.
	Signal Resolution	Input 2-phase sine wave: 1/256 pitch
	Max. Response Frequency	250 kHz
	Analog Input Signals*2 (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V
	Hall Sensor Input Signal	CMOS level
	Output Signals*3	Position data, hall sensor information, and alarms
	Output Method	Serial data transmission [HDLC (High-level Data Link Control) protocol format with Manchester codes]
	Transmission Cycle	62.5 μs
	Output Circuit	Balanced transceiver (SN75LBC176 or the equivalent) Internal terminal resistance: 120Ω
Mechanical Characteristics	Approx. Mass	150 g
	Vibration Resistance	98 m/s^2 max. (10 Hz to 2500 Hz) in three directions
	Shock Resistance	980 m/s^2, (11 ms) two times in three directions
Environmental Conditions	Operating Temperature	0˚C to 55˚C
	Storage Temperature	−20˚C to +80˚C
	Humidity	20% to 90%RH (no condensation)

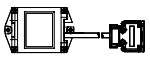
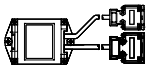
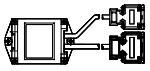
*1: The current consumption of the linear scale and hall sensor is not included in this value.
The current consumption of linear scale and hall sensor must be taken into consideration for the current capacity of host controller that supplies the power. The current consumption of hall sensor: Approx. 40 mA.

*2: Input a value within the specified range. Otherwise, incorrect position information is output, and the device may be damaged.

*3: The power is turned on, and the transmission is enabled after 100 ms to 300 ms.

● Model Designation

JZDP - D003 - 001 - E

Serial Converter Unit Model			
Symbol	Appearance	Applicable Linear Scale	Hall Sensor
D003		Made by HEIDENHAIN Corp.	None
D005		Made by Renishaw plc.	None
D006		Made by HEIDENHAIN Corp.	Provided
D008		Made by Renishaw plc.	Provided

Applicable Linear Servomotor		
Servomotor Model		Symbol
SGLTW- (T-type iron core)	20A170A	011
	20A320A	012
	20A460A	013
	35A170A	014
	35A320A	015
	35A460A	016
	35A170H	105
	35A320H	106
	50A170H	108
	50A320H	109
	40A400B	185
	40A600B	186
	80A400B	187
	80A600B	188

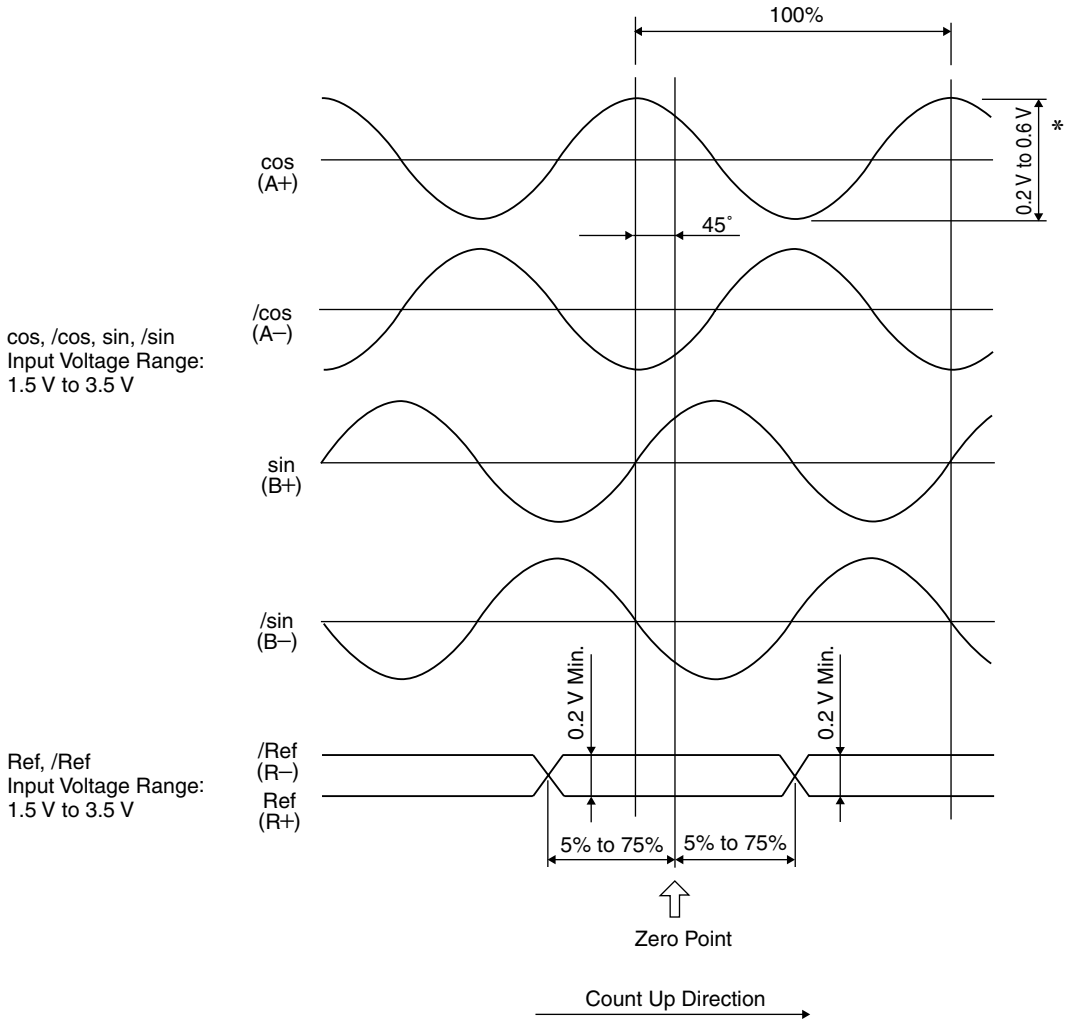
Code	Specifications
None	Not RoHS compliant
E	RoHS compliant

Note: Using the serial converter unit JZDP-A□□□ with SGDS SERVOPACK will void our guarantee.

Serial Converter Unit

● Analog Signal Input Timing

The following figure shows the input timing of the analog signals.
When the cos and sin signals are shifted 180 degrees, the differential signals are the /cos and /sin signals.
The specifications of the cos, /cos, sin, and /sin signals are identical except for the phase.
Input the signals Ref and /Ref so that they shall cross each other as shown in the figure because they are input into the converter. When they are crossed, the output data will be counted up.



*: If the analog signal amplitude declines to about 0.35 V because of differential amplitude, the serial converter outputs an alarm.

IMPORTANT

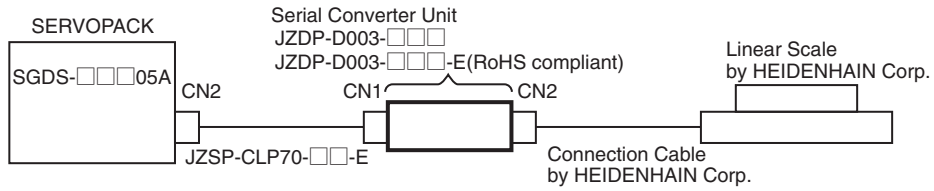
■Precautions

1 Never perform insulation resistance and withstand voltage tests.
2 When analog signals are input to the serial converter unit, noise influence on the analog signals affects the unit's ability to output correct position information. The analog cable must be as short as possible and shielded.
3 Use the serial converter unit in an environment without gases such as H_2S.
4 Do not connect or disconnect the unit while power is being supplied, or the unit may be damaged.
5 When using multiple axes, use a shield cable for each axis. Do not use a shield cable for multiple axes.

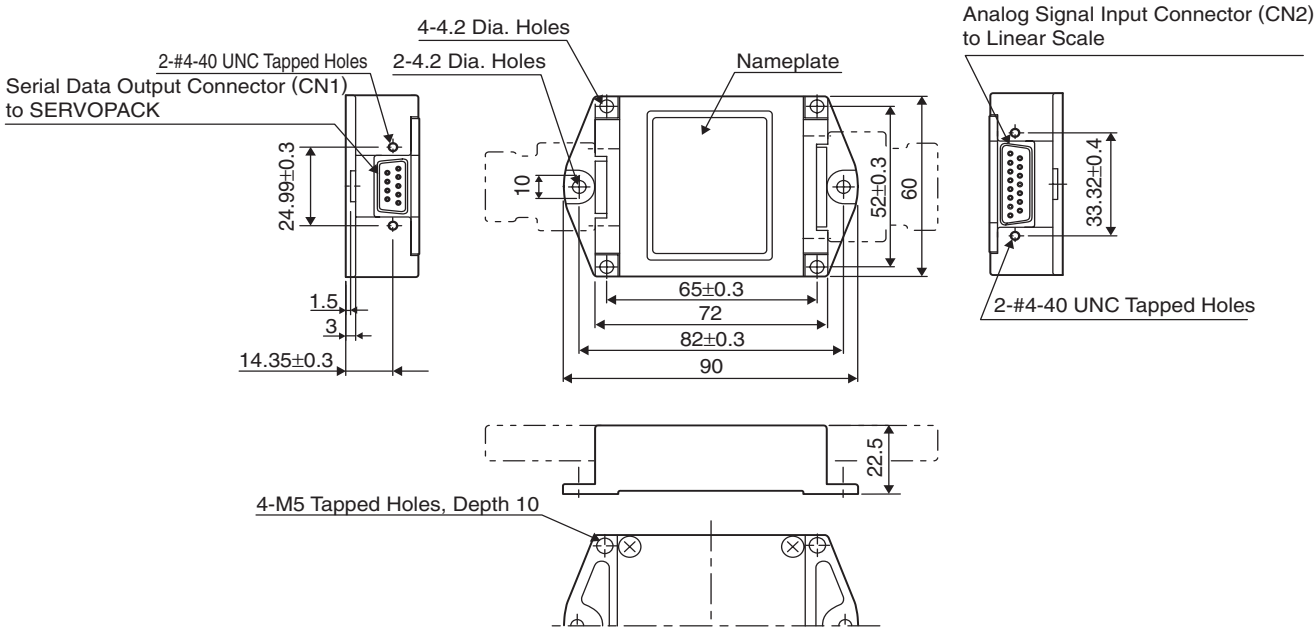
Serial Converter Unit Units: mm

- Without Cable for Hall Sensor (For Linear Scale manufactured by HEIDENHAIN Corporation)
  Serial Converter Unit: JZDP-D003-□□□
  JZDP-D003-□□□-E(RoHS compliant)

(1) Connection Example

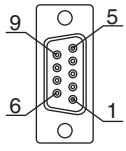


(2) External Dimensions



Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN1
Serial Data Output
to SERVOPACK

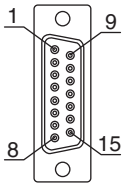


17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0 V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale



17-series Connector:
17LE-13150-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13150-27-FA
(Socket)

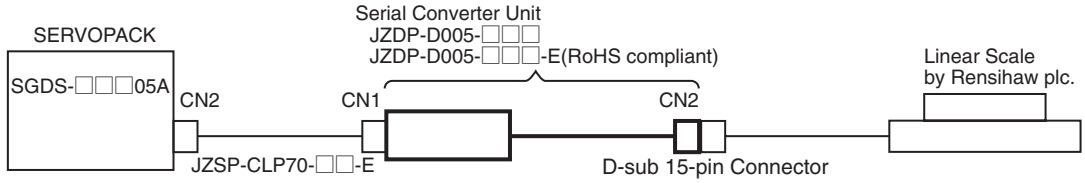
Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) manufactured by HEIDENHAIN Corp. can be directly connected. Contact HEIDENHAIN Corp. for details.
3 Use the same terminal for 5-V sensor and phase-W input.
4 Phase U, V, and W input are internally pulled up at 10 kΩ.

Serial Converter Unit Units: mm

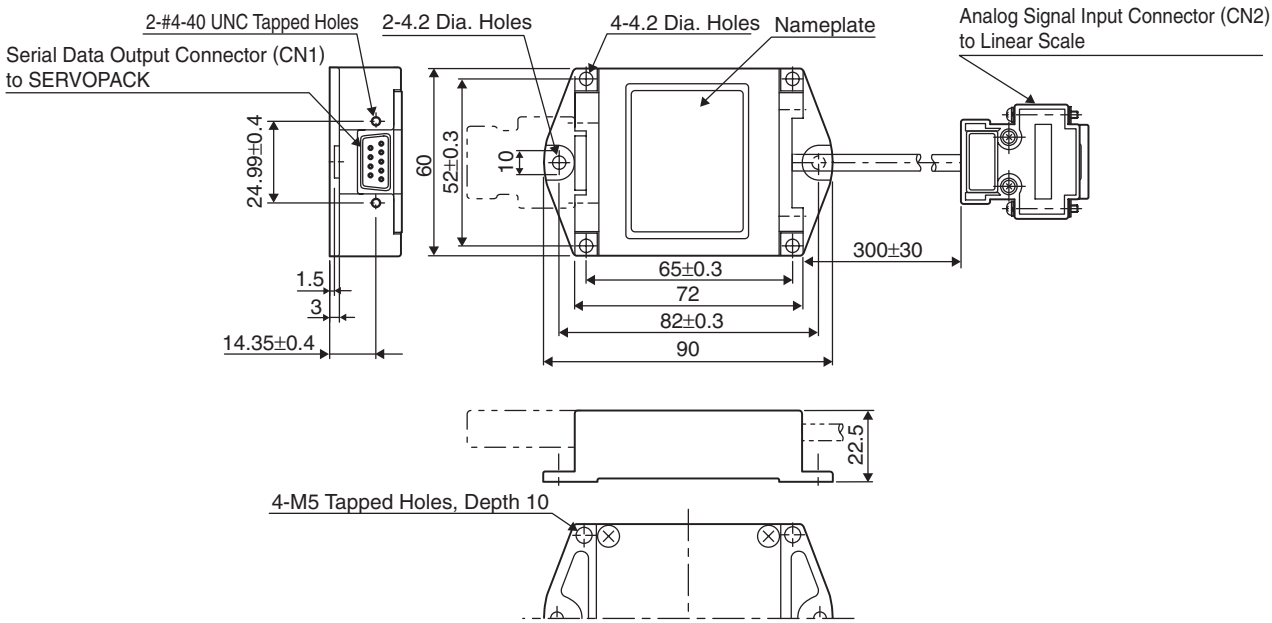
- Without Cable for Hall Sensor (For Linear Scale manufactured by Renishaw plc.)

Serial Converter Unit: JZDP-D005-□□□
JZDP-D005-□□□(RoHS compliant)

(1) Connection Example



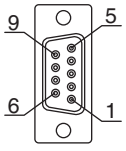
(2) External Dimensions



Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

SERVOPACK does not have the function to process Vq signals.

CN1
Serial Data Output to SERVOPACK

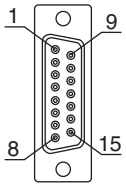


17-series Connector:
17LE-13090-27
(Socket) by DDK Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner (0V)
Case	Shield

CN2
Analog Signal Input to Linear Scale



17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK Ltd.

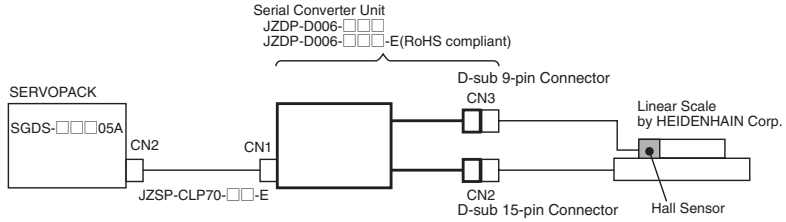
・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) by Renishaw plc. can be directly connected.
However, the BID and DIR signals are not connected.
3 Use the connector to the linear scale to change the zero point specifications of the linear scale.

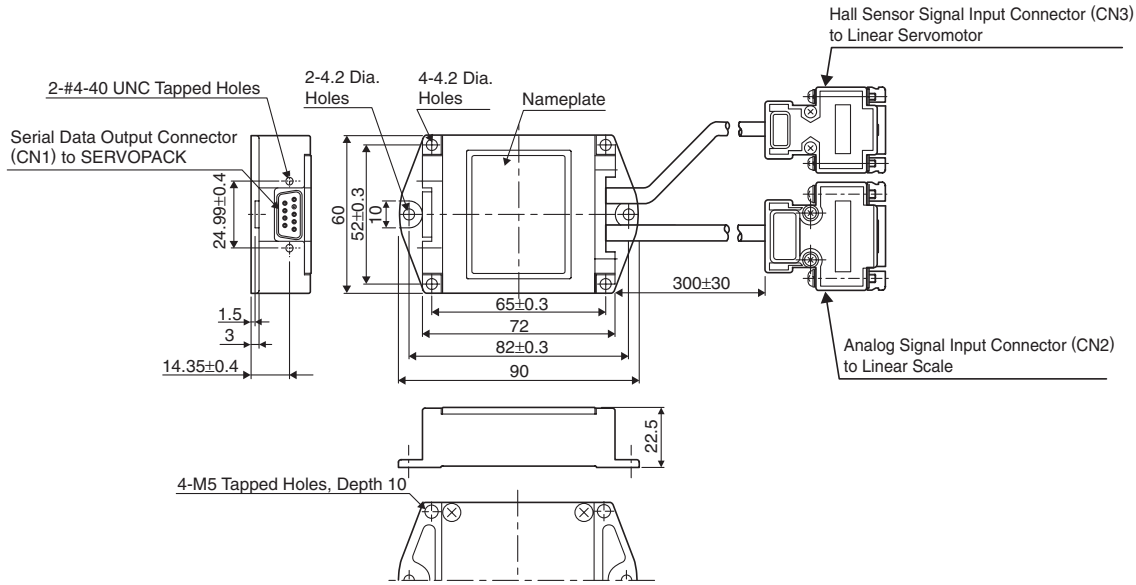
Serial Converter Unit Units: mm

- With Cable for Hall Sensor (For Linear Scale manufactured by HEIDENHAIN Corporation)
  Serial Converter Unit: JZDP-D006-□□□
  JZDP-D006-□□□-E(RoHS compliant)

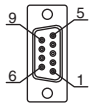
(1) Connection Example



(2) External Dimensions



CN1
Serial Data Output
to SERVOPACK

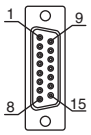


17-series Connector:
17LE-13090-27
(Socket) by DDK. Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale

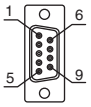


17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0 V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

CN3
Hall Sensor Signal Input
to Linear Servomotor



17-series Connector:
17JE-13090-02(D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13090-02(D8C)A-CG
(Socket)

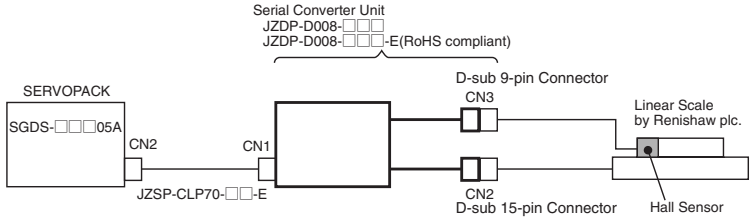
Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) by HEIDENHAIN Corp. can be directly connected. Contact HEIDENHAIN Corp. for details.
3 Phase U, V, and W input are internally pulled up at 10 kΩ.

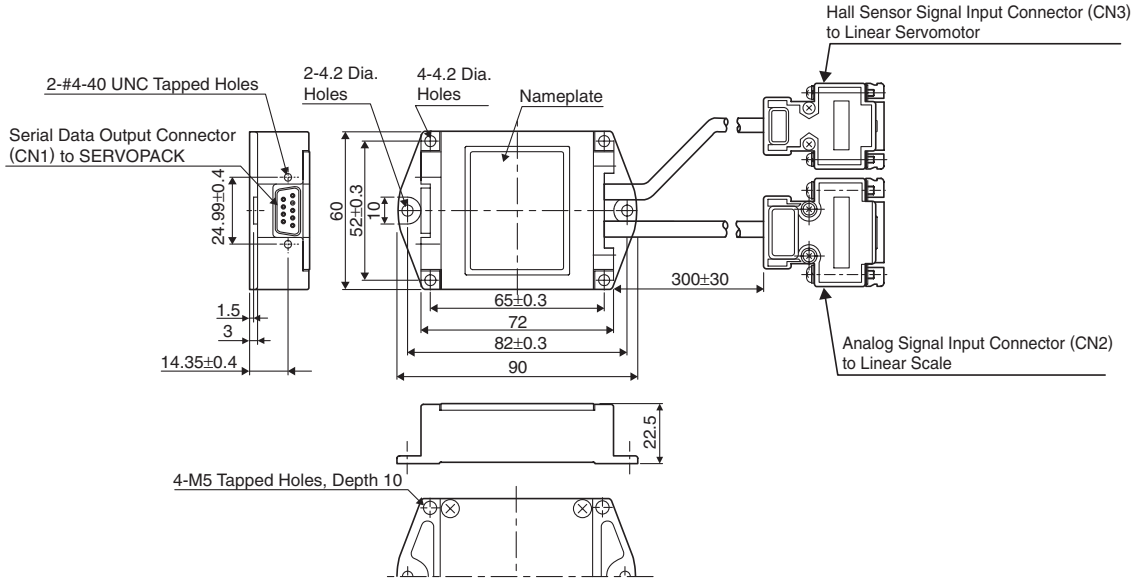
Serial Converter Unit Units: mm

- With Cable for Hall Sensor (For Linear Scale manufactured by Renishaw plc.)
  Serial Converter Unit: JZDP-D008-□□□
  JZDP-D008-□□□-E(RoHS compliant)

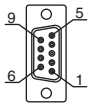
(1) Connection Example



(2) External Dimensions



CN1
Serial Data Output
to SERVOPACK

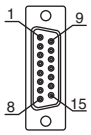


17-series Connector:
17JE-13090-27
(Socket) by DDK. Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale

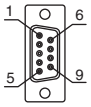


17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner
Case	Shield

CN3
Hall Sensor Signal Input
to Linear Servomotor



17-series Connector:
17JE-13090-02(D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13090-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	No used
7	No used
8	No used
9	No used
Case	Shield

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1 Vp-p output, D-sub 15-pin, male) by Renishaw plc. can be directly connected. However, the BID and DIR signals are not connected.
3 Use the connector to the linear scale to change the zero point specifications of the linear scale.
4 Phase U, V, and W input are internally pulled up at 10 kΩ.

Flexible Cables

● Life of Flexible Cable

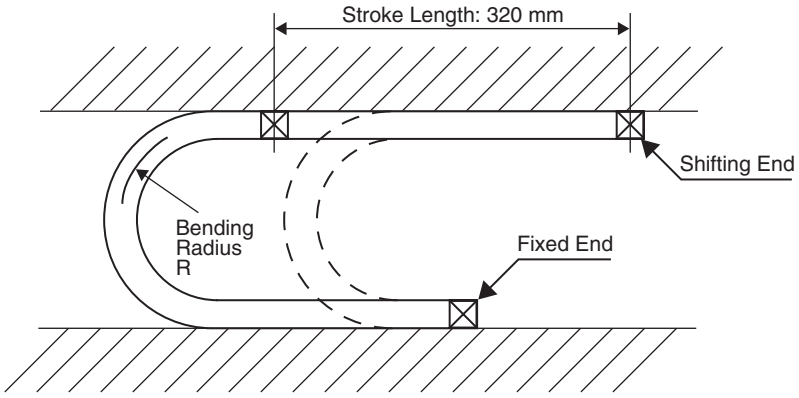
The following flexible cables have a long flex life of 10 million or more flex cycles as proven in rolling flex tests with the recommended bending radius shown in the table.

Cable	Model No.	Recommended Bending Radius mm
Linear Servomotor Main Circuit Cables	JZSP-CLN11-□□	35
	JZSP-CLN21-□□	38
	JZSP-CLN39-□□	50
	JZSP-CLN14-□□	35
Connection Cables for Linear Scale	JZSP-CLL00-□□	57
Connection Cables for Hall Sensor	JZSP-CLL10-□□	46
Connection Cables for Serial Converter Unit	JZSP-CLP70-□□	46

● Testing Conditions

1 Repeatedly flex the cable back and forth in a linear motion for a stroke length of 320 mm using the test equipment as shown.

2 Connect the lead wires in parallel, and count the number of times that the cable can be bent until one of the lead wires becomes broken or disconnected. Every time that the cable is bent and returned to its original position counts as one test cycle.



Notes: 1 The life of flexible cable greatly differs in accordance with the amount of mechanical shock applied to the cable and with the methods used to wire or fix the cable. The cable life listed here is for reference only because it was measured under specified testing conditions.

2 The life of flexible cable indicates the number of bending life in which stranded wires are electrically conducted and by which no cracks and damages that affects the performance of cable sheathing are caused. Disconnecting the shield wire is not taken into account.

Flexible Cables

- Wiring Precautions

Even if the recommended bending radius R is respected in the mechanical design, incorrect wiring may cause the early disconnection. Observe the following precautions when wiring.

(1) Twisted Cable

Straighten the flexible cables before wiring.

Twisted cables cause early disconnection. Check the indication on the cable surface to make sure that the cable is not twisted.

(2) Fixing method

Do not fix the moving points of the flexible cable. Stress on the fixed points may cause early disconnection. Fix the cable at the minimum number of points.

(3) Cable length

If the cable length is too long, it may cause the cable's sagging. Besides the cable length is too short, it may cause the excessive tension on the fixed points that will cause early disconnection. Use a flexible cable with the optimum length.

(4) Interference between cables

Avoid interference between cables.

Interference limits the motion of flexible cable, which causes early disconnection. Keep enough distance between cables, or provide a partition when wiring.

Linear Servomotors

SGLC

(Cylinder Type)

Model Designations

● Combination of Moving Coil and Magnetic Way

SGL C – D16 A 085 A P – 750 A

- SGL: Linear Σ Series Linear Servomotor
- C: Servomotor Model

Code	Specifications
C	Cylinder type

- D16: Outer Diameter of Magnetic Way
  - D16 : 16 mm
  - D20 : 20 mm
  - D25 : 25 mm
  - D32 : 32 mm
- A: Voltage
  - A : 200 VAC
- 085: Length of Moving Coil

Outer Diameter of Magnetic Way Code	Length of Moving Coil Code	Length of Moving Coil mm	Outer Diameter of Magnetic Way Code	Length of Moving Coil Code	Length of Moving Coil mm
D16	085	85	D25	125	125
	115	115		170	170
	145	145		215	215
D20	100	100	D32	165	165
	135	135		225	225
	170	170		285	285

- A: Design Revision Order of Moving Coil
  - A, B···
- P: Hall Sensor
  - P : With hall sensor (all models)
- 750: Length of Magnetic Way (See the next page)
- A: Design Revision Order of Magnetic Way
  - A, B···

● Moving Coil

SGL C W – D16 A 085 A P

- SGL: Linear Σ Series Linear Servomotor
- C: Servomotor Model

Code	Specifications
C	Cylinder type

- W: W : Moving coil
- D16: Outer Diameter of Magnetic Way
  - D16 : 16 mm
  - D20 : 20 mm
  - D25 : 25 mm
  - D32 : 32 mm
- A: Voltage
  - A : 200 VAC
- 085: Length of Moving Coil (See above table)
- A: Design Revision Order
  - A, B···
- P: Hall Sensor
  - P : With hall sensor (all models)

● Magnetic Way

SGL C M – D16 300 A

- SGL: Linear Σ Series Linear Servomotor
- C: Servomotor Model

Code	Specifications
C	Cylinder type

- M: M : Magnetic way
- D16: Outer Diameter of Magnetic Way
  - D16 : 16 mm
  - D20 : 20 mm
  - D25 : 25 mm
  - D32 : 32 mm
- 300: Length of Magnetic Way (See the next page)
- A: Design Revision Order
  - A, B···

Note: Order the moving coil and magnetic way as a set. Contact your Yaskawa representative before purchasing them separately.

Features

- Both coil assemblies supported, easy switching from ball screws.
- Compared to ball screw systems, high-speed and high-precision positioning greatly reduces tact time.
- Unlike ball screws, no contact with machines, no lubrication oil, easy maintenance.

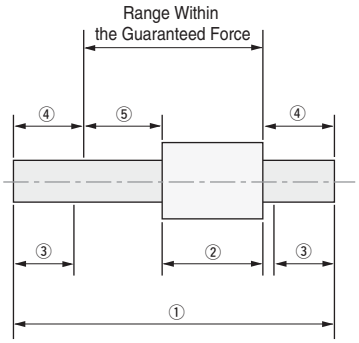
Application Examples

- Semiconductor equipment
- Electronic parts assembly
- Food packaging machines
- Metal processing machines
- General handling machines

◆ Magnetic Way Lengths

Moving Coil Model SGLCW-		Magnetic Way Dimensions mm					
		Standard Specifications					Special Orders
		Code=① mm					Length of Magnetic Way mm
			②	③	④	⑤	Min. to Max.
D16A	085AP 115AP 145AP	300	85	30	37.5	140	240 to 420 (30 mm increments)
			115			110	
			145			80	
		510	85	45	52.5	320	480 to 750 (30 mm increments)
			115			290	
			145			260	
		750	85			560	
			115			530	
			145			500	
D20A	100AP 135AP 170AP	350	100	35	45	160	280 to 490 (35 mm increments)
			135			125	
			170			90	
		590	100	50	60	370	555 to 870 (35 mm increments)
			135			335	
			170			300	
		870	100			650	
			135			615	
			170			580	
D25A	125AP 170AP 215AP	450	125	45	57.5	210	360 to 630 (45 mm increments)
			170			165	
			215			120	
		750	125	60	72.5	480	705 to 1110 (45 mm increments)
			170			435	
			215			390	
		1110	125			840	
			170			795	
			215			750	
D32A	165AP 225AP 285AP	600	165	60	75	285	480 to 840 (60 mm increments)
			225			225	
			285			165	
		1020	165	90	105	645	960 to 1500 (60 mm increments)
			225			585	
			285			525	
		1500	165			1125	
			225			1065	
			285			1005	

① Length of Magnetic Way
② Length of Moving Coil
③ Position of Support Section
④ Range Outside the Guaranteed Force
⑤ Effective Strokes



Note: ④Range outside the guaranteed force:
If any part of the moving coil is located within this range, characteristics indicated in *Force and Speed Characteristics* on page 347 cannot be satisfied.

< Calculating Length of Magnetic Way >

②Length of Moving Coil (mm)
④Range Outside the Guaranteed Force (mm)
⑤Effective Strokes (mm)

Formula

◆ Length of Magnetic Way
【②+④×2+⑤】(mm)

Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0 to 40˚C
Excitation: Permanent magnet
Withstand Voltage: 1500 VAC for one minute
Enclosure: Self-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130˚C (Thermal class B)

Linear Servomotor Model SGLC-		D16A			D20A			D25A			D32A		
		085A	115A	145A	100A	135A	170A	125A	170A	215A	165A	225A	285A
Peak Speed*3	m / s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Rated Force*1	N	17	25	34	30	45	60	70	105	140	90	135	180
Rated Current*1	Arms	0.59	0.53	0.66	0.98	0.98	1.19	1.42	1.75	3.49	1.57	2.79	2.79
Instantaneous Peak Force*1	N	60	90	120	150	225	300	280	420	560	420	630	840
Instantaneous Peak Current*1	Arms	2.07	2.07	2.52	4.90	4.90	5.95	5.68	6.98	12.96	7.32	13.01	13.01
Moving Coil Mass	kg	0.3	0.4	0.5	0.6	0.8	1.0	1.0	1.4	1.8	1.8	2.5	3.2
Force Constant	N / Arms	31.2	46.8	51.3	33.0	49.5	54.3	53.1	64.8	43.2	61.8	52.2	69.6
BEMF Constant	V / (m/s)	10.4	15.6	17.1	11.0	16.5	18.1	17.7	21.6	14.4	20.6	17.4	23.2
Motor Constant	N / $\sqrt{w}$	4.8	5.9	6.7	7.5	9.2	10.4	10.0	12.4	15.4	16.2	20.0	23.0
Electrical Time Constant	ms	0.18	0.18	0.17	0.38	0.32	0.41	0.18	0.59	0.65	0.76	1.18	1.58
Mechanical Time Constant	ms	13.1	11.7	11.3	10.70	9.50	9.30	10.1	9.2	7.6	6.9	6.3	6.0
Thermal Resistance With Heat Sink	K / W	3.35	2.9	1.64	1.66	1.45	1.29	1.00	0.68	0.61	0.77	0.53	0.49
Thermal Resistance Without Heat Sink	K / W	6.79	5.24	4.26	4.35	3.38	2.76	2.99	2.29	1.81	1.87	1.43	1.16
Magnetic Attraction*2	N	0	0	0	0	0	0	0	0	0	0	0	0
Applicable SERVOPACK	SGDS-	A5□	A5□	01□	02□	02□	02□	02□	04□	08A	04□	08A	08A

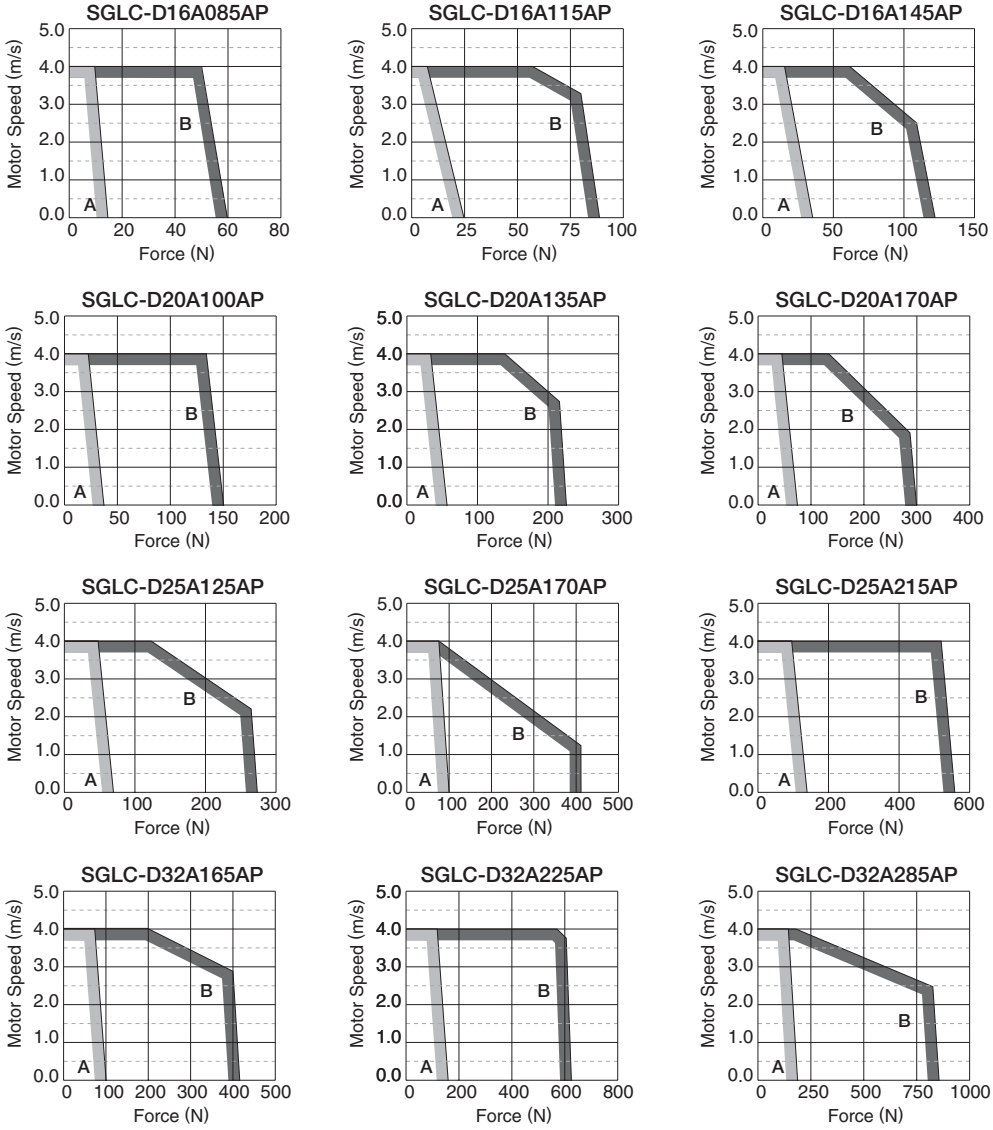
*1: These items and "Force and Speed Characteristics" are the values at a motor winding temperature of 100˚C during operation in combination with a SERVOPACK. The others are at 20˚C.
*2: Logical magnetic attraction acting between the moving coil and the magnetic way. Because of the gap imbalance created after installing the moving coil and the magnetic way, a magnetic attraction is generated.
*3: The rated speed during operation by speed control with an analog voltage reference must be set to 1.5 m/s.
Note: These specifications show the values under the cooling conditions when a heat sink (aluminum board) listed in the following table is mounted on the moving coil.

Linear Servomotor Model SGLC-	Heat Sink Size mm
D16A085A D16A115A	100×200×12
D16A145A D20A100A D20A135A D20A170A	200×300×12
D25A125A D32A165A	300×400×12
D25A170A D25A215A D32A225A D32A285A	400×500×12

Ratings and Specifications

● Force and Speed Characteristics

A : Continuous Duty Zone B : Intermittent Duty Zone (Note)



Note: When the effective force during intermittent duty is within the rated force, the servomotor can be used within the intermittent duty zone.

● Mechanical Specifications of Linear Servomotors

(1) Impact Resistance

- Impact acceleration: 98 m/s^2
- Impact occurrences: twice

(2) Vibration Resistance

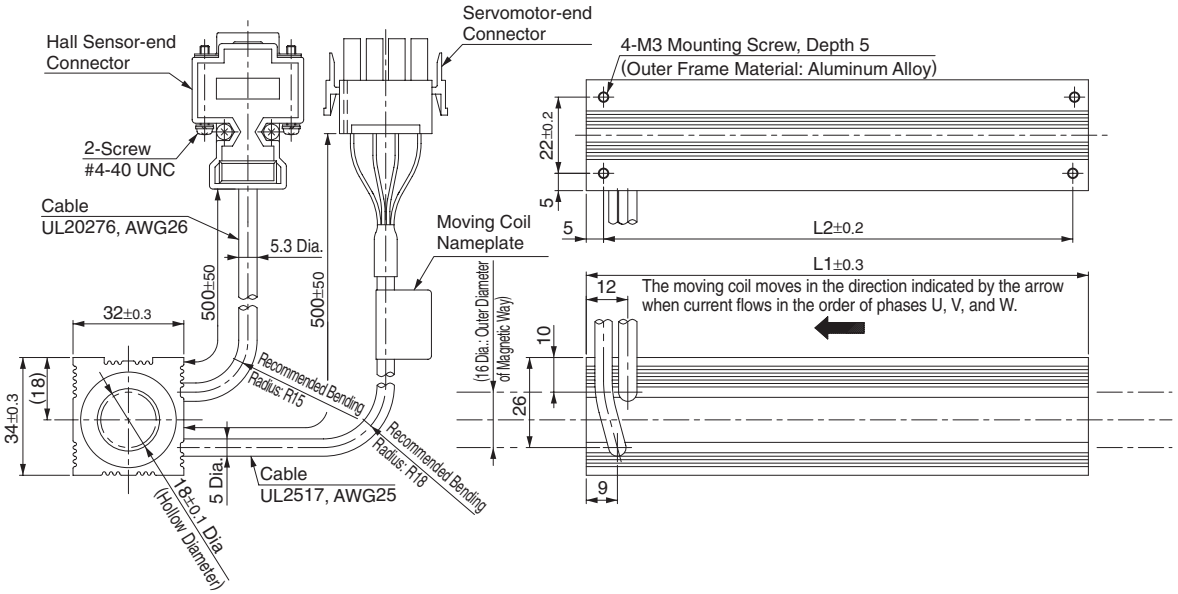
The linear servomotors will withstand the following vibration acceleration in three directions: Vertical, side to side, and front to back.

- Vibration acceleration: Moving Coil : 24.5 m/s^2
  Magnetic Way : 24.5 m/s^2 in axis direction
  4.9 m/s^2 in vertically and horizontally

External Dimensions Units: mm

• SGLC-D16 Linear Servomotors

(1) Moving Coil: SGLCW-D16A□□□AP (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor Connector Specifications

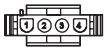
Pin Connector:
17JE-23090-02 (D8C) by DDK Ltd.

The Mating Connector

Socket Connector: 17JE-13090-02 (D8C)
Stud: 17L-002C or 17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin : 350690-3 or
350561-3 (No.1 to 3)
770210-1 (No.4)
by Tyco Electronics AMP K.K.

The Mating Connector

Cap: 350780-1
Socket: 350925-1 or
770673-1

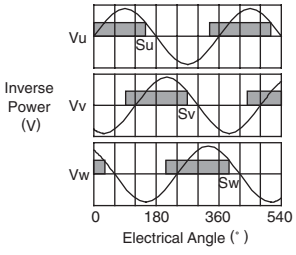
Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Moving Coil Model SGLCW-	L1	L2	Approx. Mass* kg
D16A085AP	85	75	0.3
D16A115AP	115	105	0.4
D16A145AP	145	135	0.5

*: The values indicate the mass of moving coil with a hall sensor unit.

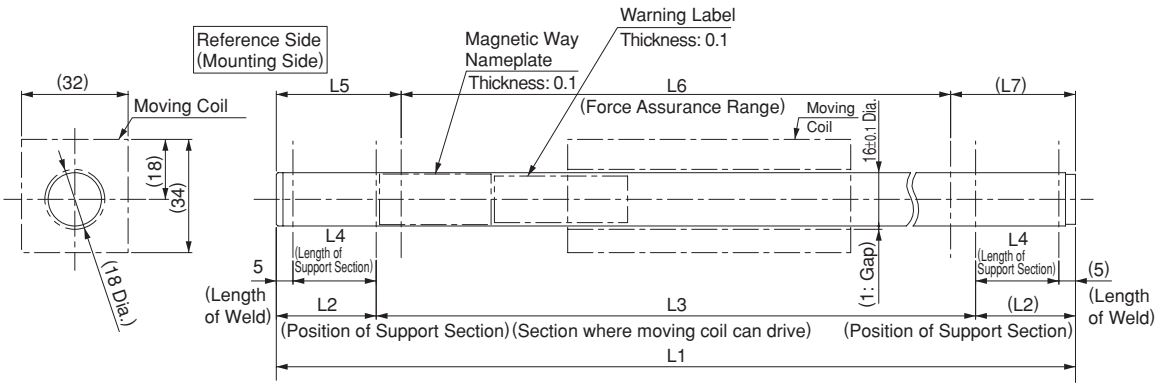
Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



External Dimensions Units: mm

(2) Magnetic Way: SGLCM-D16□□□A



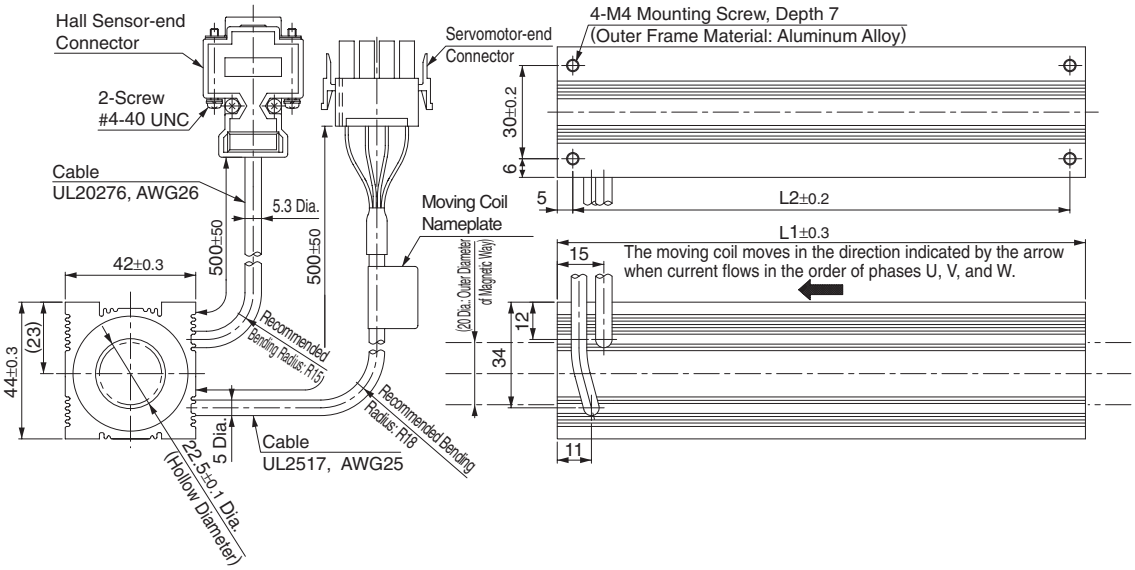
Notes: 1 The magnetic way will become deformed if a magnetic attraction with the moving coil is generated.
Take measures over the entire driving range to prevent any interference between the magnetic way and the moving coil after installation.
2 If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLCM-	L1	L2	L3	L4	L5	L6	L7	Approx. Mass kg	Remarks
D16240A	240±1.6	30	180	25	37.5±0.3	165±1.2	37.5	0.38	–
D16270A	270±1.6	30	210	25	37.5±0.3	195±1.2	37.5	0.43	
D16300A	300±1.6	30	240	25	37.5±0.3	225±1.2	37.5	0.48	Standard
D16330A	330±1.6	30	270	25	37.5±0.3	255±1.2	37.5	0.53	–
D16360A	360±1.6	30	300	25	37.5±0.3	285±1.2	37.5	0.58	
D16390A	390±1.6	30	330	25	37.5±0.3	315±1.2	37.5	0.63	
D16420A	420±1.6	30	360	25	37.5±0.3	345±1.2	37.5	0.68	
D16480A	480±2.5	45	390	40	52.5±0.3	375±2.1	52.5	0.75	
D16510A	510±2.5	45	420	40	52.5±0.3	405±2.1	52.5	0.80	Standard
D16540A	540±2.5	45	450	40	52.5±0.3	435±2.1	52.5	0.85	–
D16570A	570±2.5	45	480	40	52.5±0.3	465±2.1	52.5	0.90	
D16600A	600±2.5	45	510	40	52.5±0.3	495±2.1	52.5	0.95	
D16630A	630±2.5	45	540	40	52.5±0.3	525±2.1	52.5	1.0	
D16660A	660±2.5	45	570	40	52.5±0.3	555±2.1	52.5	1.05	
D16690A	690±2.5	45	600	40	52.5±0.3	585±2.1	52.5	1.1	
D16720A	720±2.5	45	630	40	52.5±0.3	615±2.1	52.5	1.15	
D16750A	750±3	45	660	40	52.5±0.3	645±2.5	52.5	1.2	Standard

External Dimensions Units: mm

• SGLC-D20 Linear Servomotors

(1) Moving Coil: SGLCW-D20A□□□AP (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor Connector Specifications

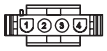
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin : 350690-3 or
350561-3 (No.1 to 3)
770210-1 (No.4)
by Tyco Electronics AMP K.K.

The Mating Connector

Cap: 350780-1
Socket: 350925-1 or
770673-1

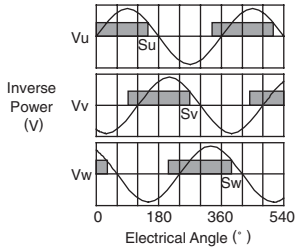
Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Moving Coil Model SGLCW-	L1	L2	Approx. Mass* kg
D20A100AP	100	90	0.6
D20A135AP	135	125	0.8
D20A170AP	170	160	1.0

*: The values indicate the mass of moving coil with a hall sensor unit.

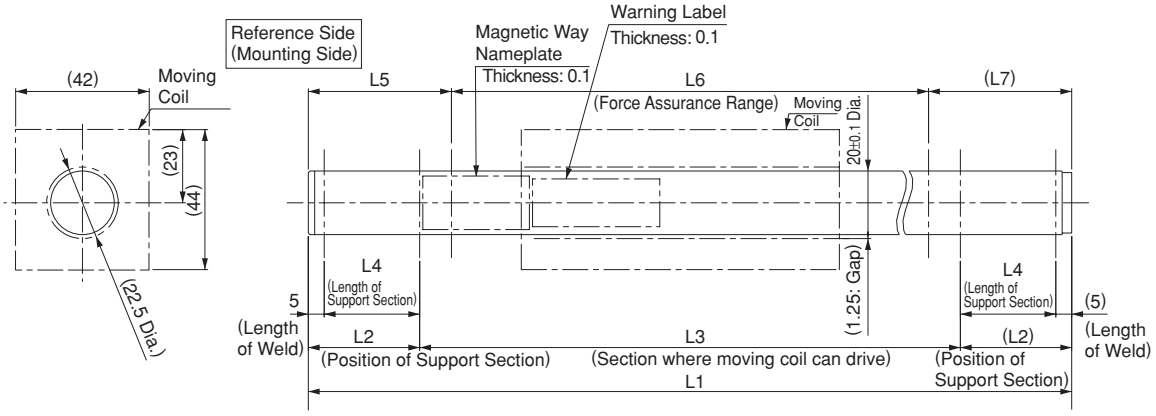
Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



External Dimensions Units: mm

(2) Magnetic Way: SGLCM-D20□□□A



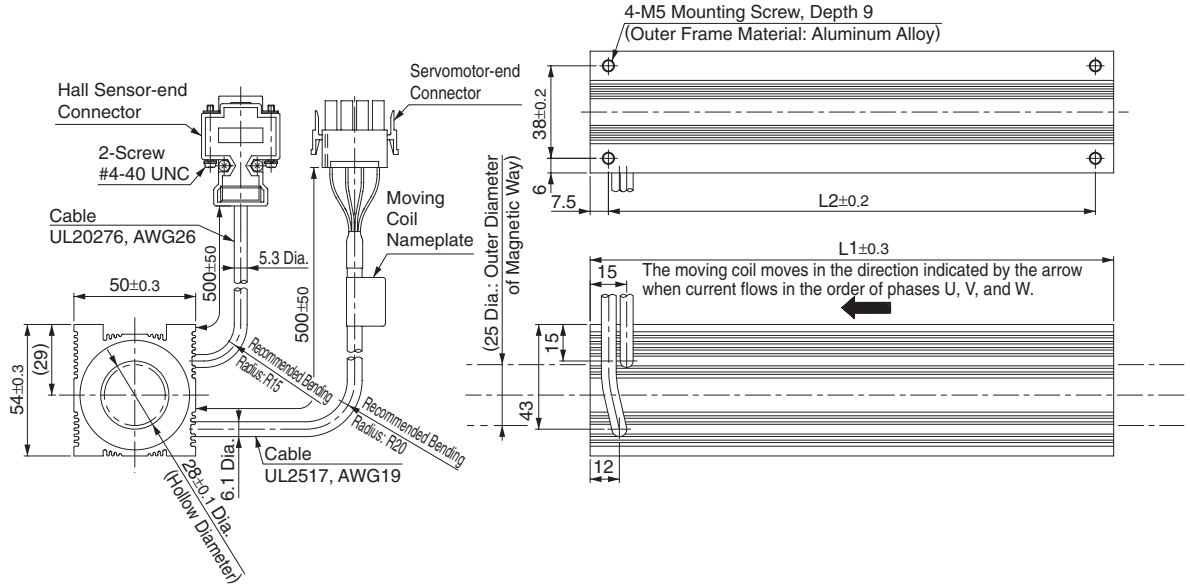
Notes: 1 The magnetic way will become deformed if a magnetic attraction with the moving coil is generated.
Take measures over the entire driving range to prevent any interference between the magnetic way and the moving coil after installation.
2 If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLCM-	L1	L2	L3	L4	L5	L6	L7	Approx. Mass kg	Remarks
D20280A	280±1.6	35	210	30	45±0.3	190±1.2	45	0.68	–
D20315A	315±1.6	35	245	30	45±0.3	225±1.2	45	0.77	
D20350A	350±1.6	35	280	30	45±0.3	260±1.2	45	0.86	Standard
D20385A	385±1.6	35	315	30	45±0.3	295±1.2	45	0.95	–
D20420A	420±1.6	35	350	30	45±0.3	330±1.2	45	1.0	
D20455A	455±1.6	35	385	30	45±0.3	365±1.2	45	1.1	
D20490A	490±1.6	35	420	30	45±0.3	400±1.2	45	1.2	
D20555A	555±2.5	50	455	45	60±0.3	435±2.1	60	1.35	
D20590A	590±2.5	50	490	45	60±0.3	470±2.1	60	1.45	Standard
D20625A	625±2.5	50	525	45	60±0.3	505±2.1	60	1.55	–
D20660A	660±2.5	50	560	45	60±0.3	540±2.1	60	1.6	
D20695A	695±2.5	50	595	45	60±0.3	575±2.1	60	1.7	
D20730A	730±2.5	50	630	45	60±0.3	610±2.1	60	1.8	
D20765A	765±2.5	50	665	45	60±0.3	645±2.1	60	1.9	
D20800A	800±2.5	50	700	45	60±0.3	680±2.1	60	2.0	
D20835A	835±2.5	50	735	45	60±0.3	715±2.1	60	2.1	
D20870A	870±3	50	770	45	60±0.3	750±2.5	60	2.2	Standard

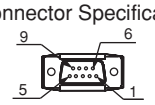
External Dimensions Units: mm

• SGLC-D25 Linear Servomotors

(1) Moving Coil: SGLCW-D25A□□□AP (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor Connector Specifications



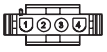
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin: (No. 1 to 3)
350561-3 or 350690-3
(No. 4)
350654-1 or 350669-1
by Tyco Electronics AMP K.K.

The Mating Connector

Cap : 350780-1
Socket: 350925-1 or
770673-1

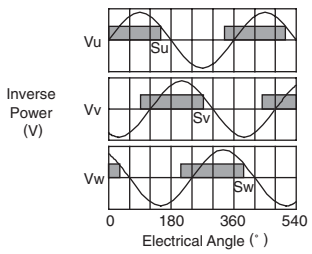
Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Moving Coil Model SGLCW-	L1	L2	Approx. Mass* kg
D25A125AP	125	110	1.0
D25A170AP	170	153	1.4
D25A215AP	215	200	1.8

*: The values indicate the mass of moving coil with a hall sensor unit.

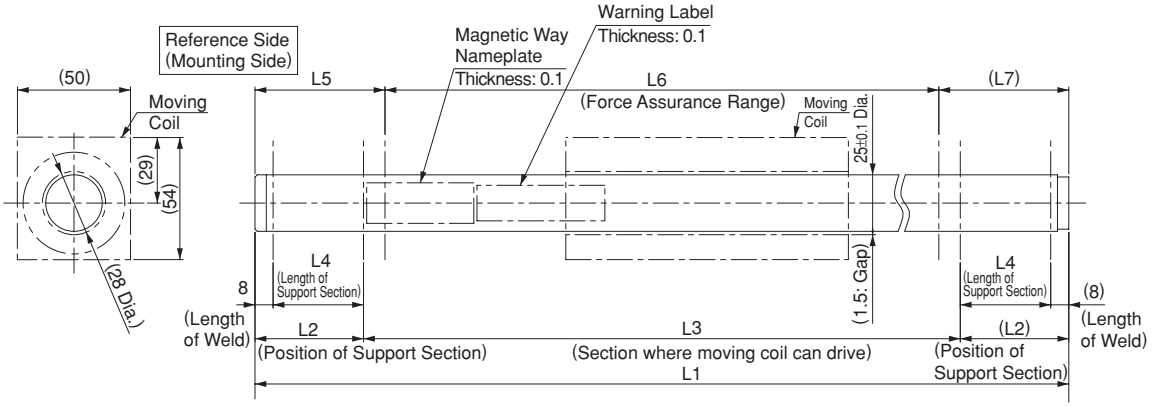
Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



External Dimensions Units: mm

(2) Magnetic Way: SGLCM-D25□□□A



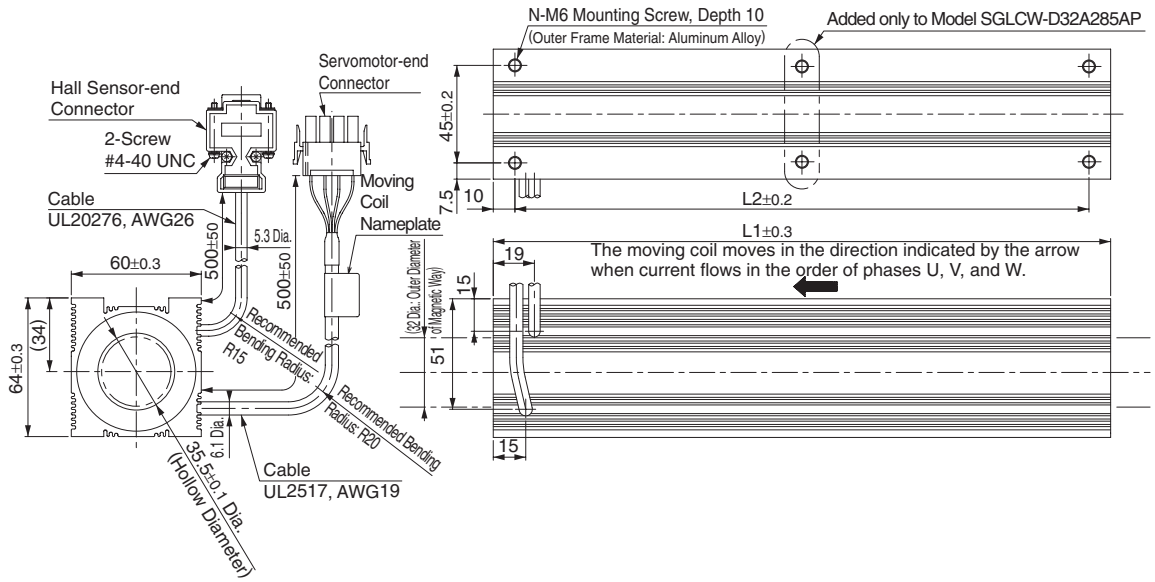
Notes: 1 The magnetic way will become deformed if a magnetic attraction with the moving coil is generated.
Take measures over the entire driving range to prevent any interference between the magnetic way and the moving coil after installation.
2 If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLCM-	L1	L2	L3	L4	L5	L6	L7	Approx. Mass kg	Remarks
D25360A	360±1.6	45	270	37	57.5±0.3	245±1.2	57.5	1.5	–
D25405A	405±1.6	45	315	37	57.5±0.3	290±1.2	57.5	1.65	
D25450A	450±1.6	45	360	37	57.5±0.3	335±1.2	57.5	1.8	Standard
D25495A	495±1.6	45	405	37	57.5±0.3	380±1.2	57.5	1.95	–
D25540A	540±1.6	45	450	37	57.5±0.3	425±1.2	57.5	2.1	
D25585A	585±1.6	45	495	37	57.5±0.3	470±1.2	57.5	2.25	
D25630A	630±1.6	45	540	37	57.5±0.3	515±1.2	57.5	2.4	
D25705A	705±2.5	60	585	52	72.5±0.3	560±2.1	72.5	2.85	
D25750A	750±2.5	60	630	52	72.5±0.3	605±2.1	72.5	3.0	Standard
D25795A	795±2.5	60	675	52	72.5±0.3	650±2.1	72.5	3.15	–
D25840A	840±2.5	60	720	52	72.5±0.3	695±2.1	72.5	3.3	
D25885A	885±2.5	60	765	52	72.5±0.3	740±2.1	72.5	3.45	
D25930A	930±2.5	60	810	52	72.5±0.3	785±2.1	72.5	3.6	
D25975A	975±2.5	60	855	52	72.5±0.3	830±2.1	72.5	3.75	
D251020A	1020±2.5	60	900	52	72.5±0.3	875±2.1	72.5	3.9	
D251065A	1065±2.5	60	945	52	72.5±0.3	920±2.1	72.5	4.05	
D251110A	1110±3	60	990	52	72.5±0.3	965±2.5	72.5	4.2	Standard

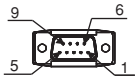
External Dimensions Units: mm

• SGLC-D32 Linear Servomotors

(1) Moving Coil: SGLCW-D32A□□□AP (With a connector by Tyco Electronics AMP K.K.)



Hall Sensor Connector Specifications



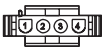
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin: (No. 1 to 3)
350561-3 or 350690-3
(No. 4)
350654-1 or 350669-1
by Tyco Electronics AMP K.K.

The Mating Connector

Cap: 350780-1
Socket: 350925-1 or
770673-1

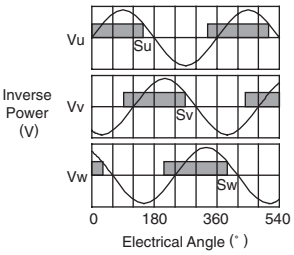
Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

Moving Coil Model SGLCW-	L1	L2	N	Approx. Mass* kg
D32A165AP	165	145	4	1.8
D32A225AP	225	205	4	2.5
D32A285AP	285	265	6	3.2

*: The values indicate the mass of moving coil with a hall sensor unit.

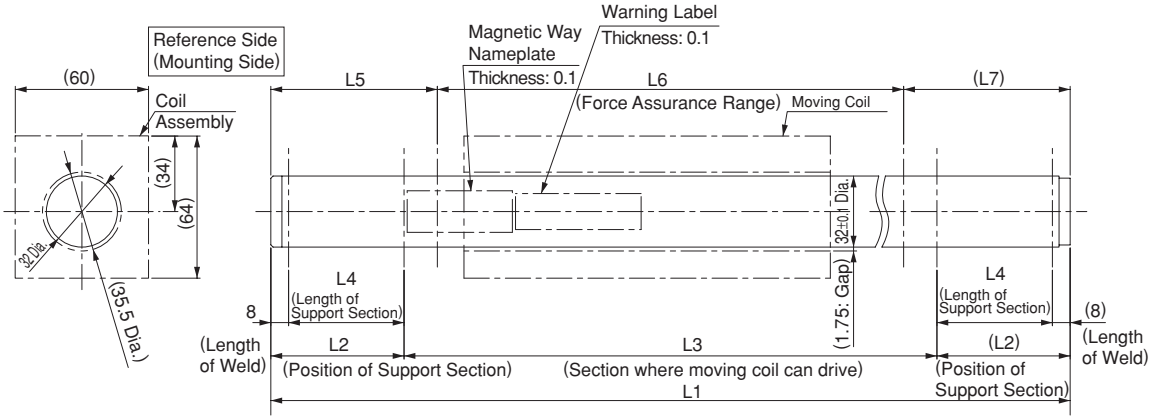
Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



External Dimensions Units: mm

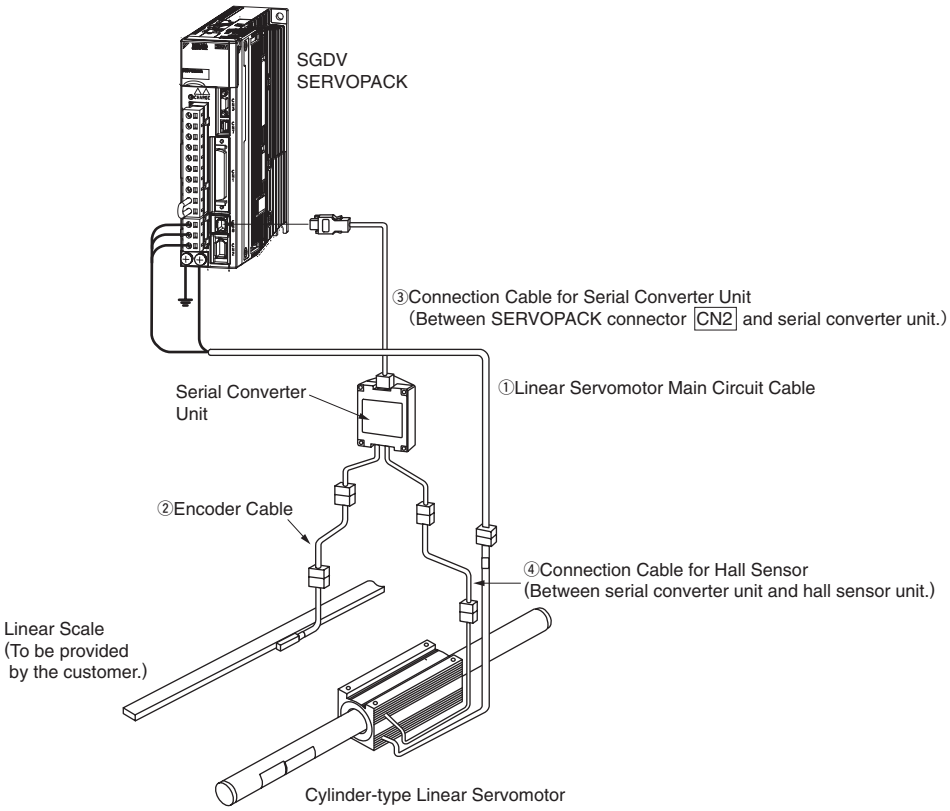
(2) Magnetic Way: SGLCM-D32□□□A

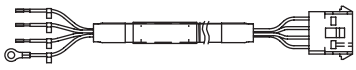
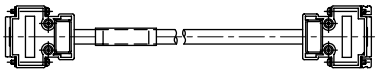
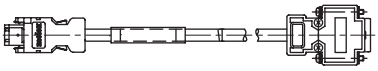
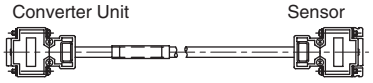


Notes: 1 The magnetic way will become deformed if a magnetic attraction with the moving coil is generated.
Take measures over the entire driving range to prevent any interference between the magnetic way and the moving coil after installation.
2 If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLCM-	L1	L2	L3	L4	L5	L6	L7	Approx. Mass kg	Remarks
D32480A	480±1.6	60	360	52	75±0.3	330±1.2	75	3.0	–
D32540A	540±1.6	60	420	52	75±0.3	390±1.2	75	3.4	
D32600A	600±1.6	60	480	52	75±0.3	450±1.2	75	3.8	Standard
D32660A	660±1.6	60	540	52	75±0.3	510±1.2	75	4.2	–
D32720A	720±1.6	60	600	52	75±0.3	570±1.2	75	4.6	
D32780A	780±1.6	60	660	52	75±0.3	630±1.2	75	5.0	
D32840A	840±1.6	60	720	52	75±0.3	690±1.2	75	5.4	
D32960A	960±2.5	90	780	82	105±0.3	750±2.1	105	5.9	
D321020A	1020±2.5	90	840	82	105±0.3	810±2.1	105	6.3	Standard
D321080A	1080±2.5	90	900	82	105±0.3	870±2.1	105	6.7	–
D321140A	1140±2.5	90	960	82	105±0.3	930±2.1	105	7.1	
D321200A	1200±2.5	90	1020	82	105±0.3	990±2.1	105	7.5	
D321260A	1260±2.5	90	1080	82	105±0.3	1050±2.1	105	7.9	
D321320A	1320±2.5	90	1140	82	105±0.3	1110±2.1	105	8.3	
D321380A	1380±2.5	90	1200	82	105±0.3	1170±2.1	105	8.7	
D321440A	1440±2.5	90	1260	82	105±0.3	1230±2.1	105	9.1	
D321500A	1500±3	90	1320	82	105±0.3	1290±2.5	105	9.5	Standard

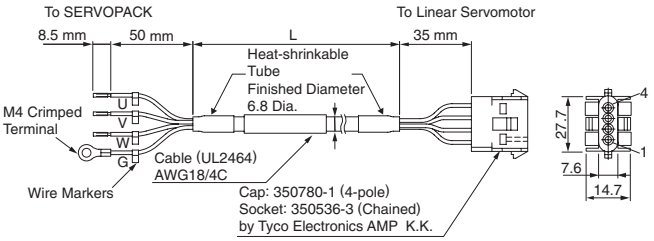
Selecting Cables



Name	Applicable Linear Servomotor Model	Length	Order No.	Specifications	Details
① Linear Servomotor Main Circuit Cables	All models	1 m	JZSP-CLN11-01-E	To SERVOPACK / To Linear Servomotor 	(1)
		3 m	JZSP-CLN11-03-E		
		5 m	JZSP-CLN11-05-E		
		10 m	JZSP-CLN11-10-E		
		15 m	JZSP-CLN11-15-E		
② Encoder Cable	All models	1 m	JZSP-CLL00-01-E	To Serial Converter Unit / To Linear Scale 	(2)
		3 m	JZSP-CLL00-03-E		
		5 m	JZSP-CLL00-05-E		
		10 m	JZSP-CLL00-10-E		
		15 m	JZSP-CLL00-15-E		
③ Connection Cable for Serial Converter Unit	All models	1 m	JZSP-CLP70-01-E	To SERVOPACK / To Serial Converter Unit 	(3)
		3 m	JZSP-CLP70-03-E		
		5 m	JZSP-CLP70-05-E		
		10 m	JZSP-CLP70-10-E		
		15 m	JZSP-CLP70-15-E		
		20 m	JZSP-CLP70-20-E		
④ Connection Cable for Hall Sensor	All models	1 m	JZSP-CLL10-01-E	To Serial Converter Unit / To Hall Sensor 	(4)
		3 m	JZSP-CLL10-03-E		
		5 m	JZSP-CLL10-05-E		
		10 m	JZSP-CLL10-10-E		
		15 m	JZSP-CLL10-15-E		

Selecting Cables

(1) Linear Servomotor Main Circuit Cables: JZSP-CLN11-□□-E

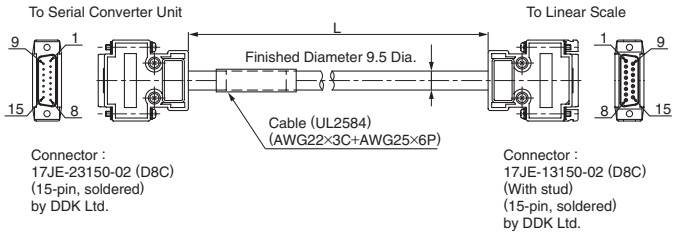


・Wiring Specifications

Leads to SERVOPACK / Connector to Linear Servomotor

Wire Color	Signal	Signal	Pin. No.
Red	Phase U	Phase U	1
White	Phase V	Phase V	2
Blue	Phase W	Phase W	3
Green/yellow	FG	FG	4

(2) Cables for Connecting Linear Scales: JZSP-CLL00-□□-E

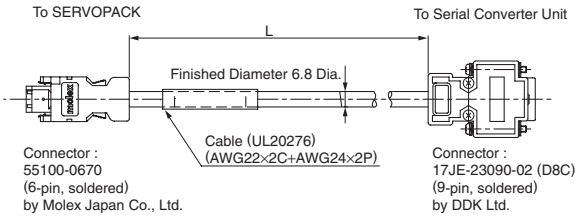


・Wiring Specifications

To Serial Converter Unit / To Linear Scale

Pin No.	Signal	Pin No.	Signal
1	/Cos(V1−)	1	/Cos(V1−)
2	/Sin(V2−)	2	/Sin(V2−)
3	Ref(V0+)	3	Ref(V0+)
4	+5V	4	+5V
5	5Vs	5	5Vs
6	BID	6	BID
7	Vx	7	Vx
8	Vq	8	Vq
9	Cos(V1+)	9	Cos(V1+)
10	Sin(V2+)	10	Sin(V2+)
11	/Ref(V0+)	11	/Ref(V0−)
12	0V	12	0V
13	0Vs	13	0Vs
14	DIR	14	DIR
15	Inner	15	Inner
Case	Shield	Case	Shield

(3) Connection Cable for Serial Converter Unit: JZSP-CLP70-□□-E

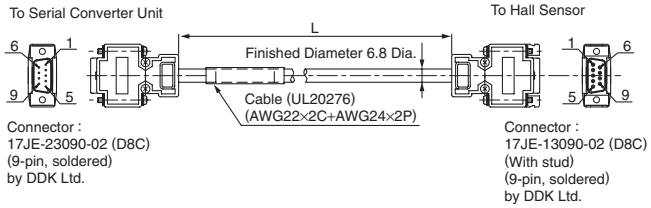


・Wiring Specifications

Leads to SERVOPACK / To Serial Converter Unit

Pin No.	Signal	Wire Color	Pin No.	Signal	Wire Color
1	PG5V	Red	1	+5V	Red
2	PG0V	Black	5	0V	Black
3	-	-	3	-	-
4	-	-	4	-	-
5	PS	Light blue	2	Phase S output	Light blue
6	/PS	Light blue/white	6	Phase /S output	Light blue/white
Shell	Shield	-	Case	Shield	-
			7	-	-
			8	-	-
			9	-	-

(4) Connection Cable for Hall Sensor: JZSP-CLL10-□□-E



・Wiring Specifications

To Serial Converter Unit / To Hall Sensor

Pin No.	Signal	Pin No.	Signal
1	+5V	1	+5V
2	Phase U input	2	Phase U input
3	Phase V input	3	Phase V input
4	Phase W input	4	Phase W input
5	0V	5	0V
6	-	6	-
7	-	7	-
8	-	8	-
9	-	9	-
Case	Shield	Case	Shield

Serial Converter Unit

● Characteristics and Specifications

	Items	Specifications
Electrical Characteristics	Power Supply Voltage	+5.0 V±5%, ripple content 5% max.
	Current Consumption*1	120 mA typ. 350 mA max.
	Signal Resolution	Input 2-phase sine wave: 1/256 pitch
	Max. Response Frequency	250 kHz
	Analog Input Signals*2 (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V
	Hall Sensor Input Signal	CMOS level
	Output Signals*3	Position data, hall sensor information, and alarms
	Output Method	Serial data transmission [HDLC (High-level Data Link Control) protocol format with Manchester codes]
	Transmission Cycle	62.5 μs
	Output Circuit	Balanced transceiver (SN75LBC176 or the equivalent) Internal terminal resistance: 120Ω
Mechanical Characteristics	Approx. Mass	150 g
	Vibration Resistance	98 m/s^2 max. (10 Hz to 2500 Hz) in three directions
	Shock Resistance	980 m/s^2, (11 ms) two times in three directions
Environmental Conditions	Operating Temperature	0˚C to 55˚C
	Storage Temperature	−20˚C to +80˚C
	Humidity	20% to 90% RH (no condensation)

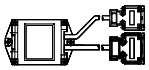
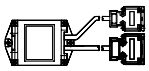
*1: The current consumption of the linear scale and hall sensor is not included in this value.
The current consumption of linear scale and hall sensor must be taken into consideration for the current capacity of host controller that supplies the power. The current consumption of hall sensor: Approx. 40 mA.

*2: Input a value within the specified range. Otherwise, incorrect position information is output, and the device may be damaged.

*3: The power is turned on, and the transmission is enabled after 100 ms to 300ms.

● Model Designation

JZDP - D003 - 001 - E

Serial Converter Unit Model			
Symbol	Appearance	Applicable Linear Scale	Hall Sensor
D006		Made by HEIDENHAIN Corp.	Provided
D008		Made by Renishaw plc.	Provided

Note: Using the serial converter unit JZDP-A□□□ with SGDS SERVOPACK will void our guarantee.

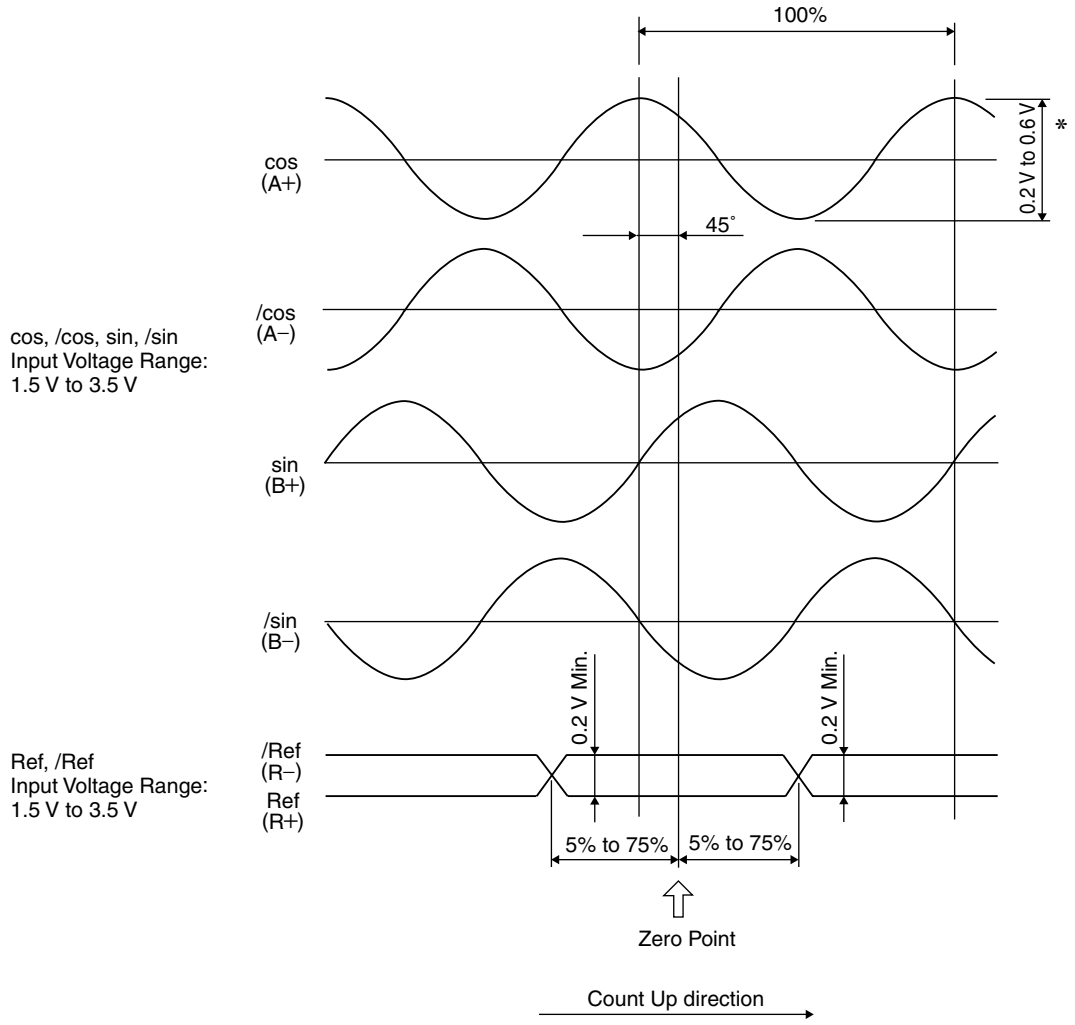
Applicable Linear Servomotor		
Servomotor Model		Symbol
SGLC- (Cylinder Type)	D16A085AP	354
	D16A115AP	373
	D16A145AP	356
	D20A100AP	357
	D20A135AP	358
	D20A170AP	359
	D25A125AP	360
	D25A170AP	374
	D25A215AP	362
	D32A165AP	363
	D32A225AP	364
	D32A285AP	365

Code	Specifications
None	Not RoHS compliant
E	RoHS compliant

Serial Converter Unit

● Analog Signal Input Timing

The following figure shows the input timing of the analog signals.
When the cos and sin signals are shifted 180 degrees, the differential signals are the /cos and /sin signals.
The specifications of the cos, /cos, sin, and /sin signals are identical except for the phase.
Input the signals Ref and /Ref so that they shall cross each other as shown in the figure because they are input into the converter. When they are crossed, the output data will be counted up.



*:If the analog signal amplitude declines to about 0.35 V because of differential amplitude, the serial converter outputs an alarm.

IMPORTANT

■Precautions

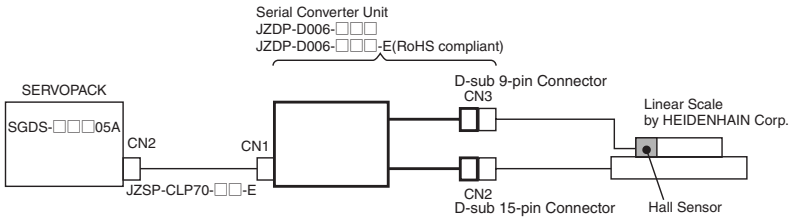
1 Never perform insulation resistance and withstand voltage tests.
2 When analog signals are input to the serial converter unit, noise influence on the analog signals affects the unit's ability to output correct position information. The analog cable must be as short as possible and shielded.
3 Use the serial converter unit in an environment without gases such as H_2S.
4 Do not connect or disconnect the unit while power is being supplied, or the unit may be damaged.
5 When using multiple axes, use a shield cable for each axis. Do not use a shield cable for multiple axes.

Serial Converter Unit Units: mm

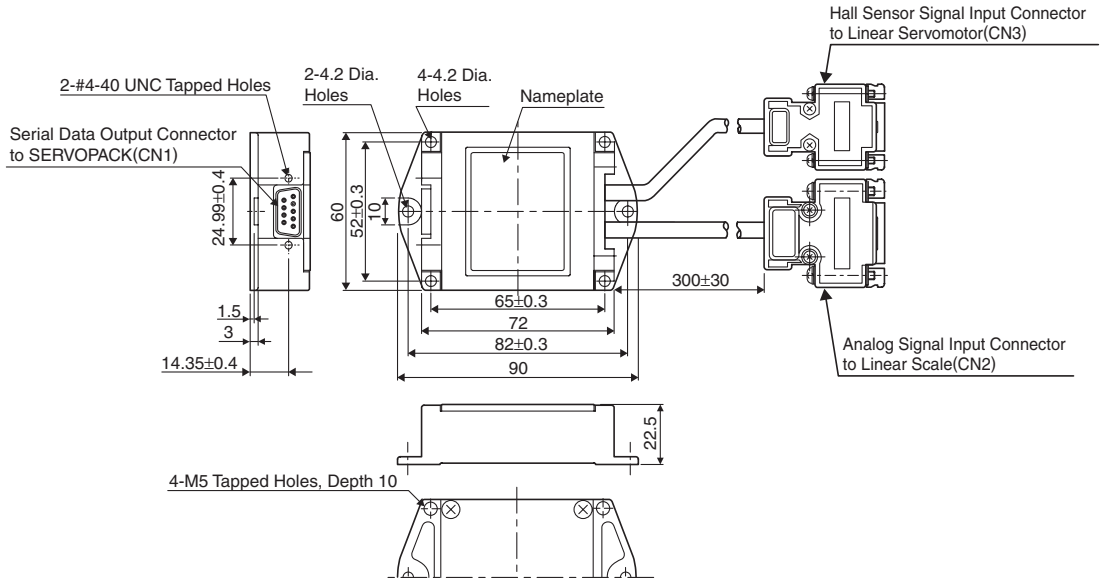
● With Cable for Hall Sensor (For Linear Scale manufactured by HEIDENHAIN corporation)

Serial Converter Unit: JZDP-D006-□□□
JZDP-D006-□□□-E(RoHS compliant)

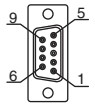
(1) Connection Example



(2) External Dimensions



CN1
Serial Data Output
to SERVOPACK

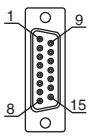


17-series Connector:
17LE-13090-27
(Socket) by DDK. Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale

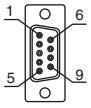


17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	cos input (A+)
2	0 V
3	sin input (B+)
4	+5 V
5	Not used
6	Not used
7	/Ref input (R–)
8	Not used
9	/cos input (A–)
10	0 V sensor
11	/sin input (B–)
12	5 V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

CN3
Hall Sensor Signal Input
to Linear Servomotor



17-series Connector:
17JE-13090-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13090-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

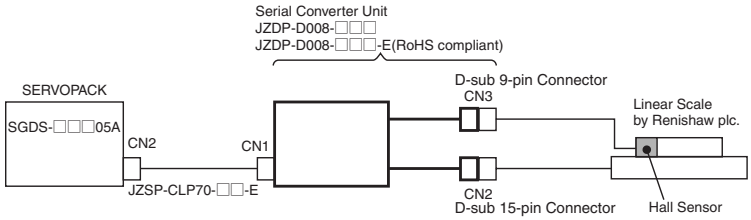
Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1Vp-p output, D-sub 15-pin, male) by HEIDENHAIN Corp. can be directly connected. Contact HEIDENHAIN Corp. for details.
3 Phase U, V, and W input are internally pulled up at 10 kΩ.

Serial Converter Unit Units: mm

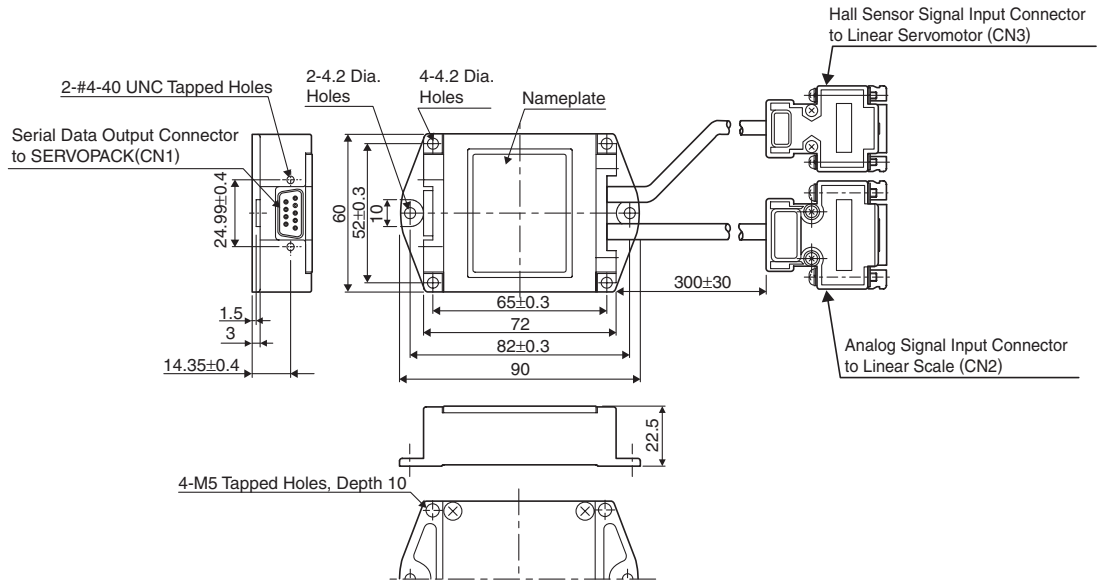
- With Cable for Hall Sensor (For Linear Scale manufactured by Renishaw plc.)

Serial Converter Unit: JZDP-D008-□□□
JZDP-D008-□□□-E (RoHS compliant)

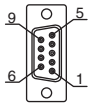
(1) Connection Example



(2) External Dimensions



CN1
Serial Data Output
to SERVOPACK

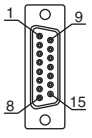


17-series Connector:
17LE-13090-27
(Socket) by DDK. Ltd.

・RoHS compliant
17LE-13090-27-FA
(Socket)

Pin No.	Signal
1	+5 V
2	Phase S output
3	Not used
4	Not used
5	0 V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

CN2
Analog Signal Input
to Linear Scale

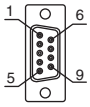


17-series Connector:
17JE-13150-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13150-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	/cos input (V1–)
2	/sin input (V2–)
3	Ref input (V0+)
4	+5 V
5	5 Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0–)
12	0 V
13	0 Vs
14	Not used
15	Inner
Case	Shield

CN3
Hall Sensor Signal Input
to Linear Servomotor



17-series Connector:
17JE-13090-02 (D8C)
(Socket) by DDK. Ltd.

・RoHS compliant
17JE-13090-02(D8C)A-CG
(Socket)

Pin No.	Signal
1	+5 V
2	Phase U input
3	Phase V input
4	Phase W input
5	0 V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

Notes: 1 Do not use the unused pins.
2 The linear scale (analog 1 Vp-p output, D-sub 15-pin, male) by Renishaw plc. can be directly connected.
However, the BID and DIR signals are not connected.
3 Use the connector to the linear scale to change the zero point specifications of the linear scale.
4 Phase U, V, and W input are internally pulled up at 10 kΩ.

Flexible Cables

● Life of Flexible Cable

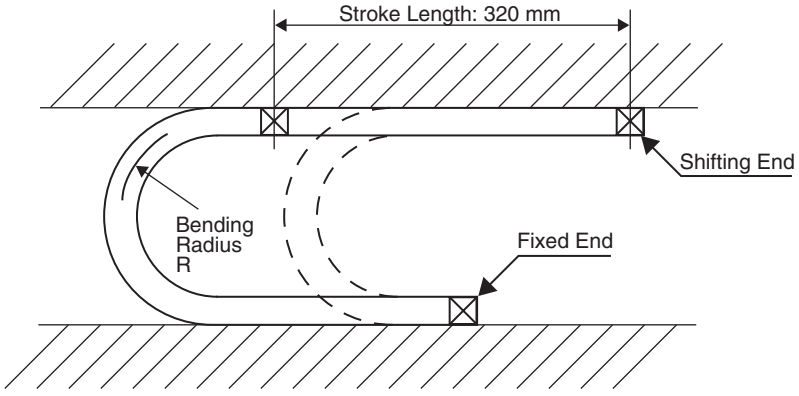
The following flexible cables have a long flex life of 10 million or more flex cycles as proven in rolling flex tests with the recommended bending radius shown in the table.

Cable	Model No.	Recommended Bending Radius mm
Linear Servomotor Main Circuit Cables	JZSP-CLN11-□□	35
	JZSP-CLN21-□□	38
	JZSP-CLN39-□□	50
	JZSP-CLN14-□□	35
Connection Cables for Linear Scales	JZSP-CLL00-□□	57
Connection Cables for Hall Sensors	JZSP-CLL10-□□	46
Connection Cables for Serial Converter Units	JZSP-CLP70-□□	46

● Testing Conditions

1 Repeatedly flex the cable back and forth in a linear motion for a stroke length of 320 mm using the test equipment as shown.

2 Connect the lead wires in parallel, and count the number of times that the cable can be bent until one of the lead wires becomes broken or disconnected. Every time that the cable is bent and returned to its original position counts as one test cycle.



Notes: 1 The life of flexible cable greatly differs in accordance with the amount of mechanical shock applied to the cable and with the methods used to wire or fix the cable. The cable life listed here is for reference only because it was measured under specified testing conditions.

2 The life of flexible cable indicates the number of bending life in which stranded wires are electrically conducted and by which no cracks and damages that affects the performance of cable sheathing are caused. Disconnecting the shield wire is not taken into account.

Flexible Cables

- Wiring Precautions

Even if the recommended bending radius R is respected in the mechanical design, incorrect wiring may cause early disconnection. Observe the following precautions when wiring.

(1) Twisted cable

Straighten the flexible cables before wiring.

Twisted cables cause early disconnection. Check the indication on the cable surface to make sure that the cable is not twisted.

(2) Fixing method

Do not fix the moving points of the flexible cable. Stress on the fixed points may cause early disconnection. Fix the cable at the minimum number of points.

(3) Cable length

If the cable length is too long, it may cause the cable's sagging. Besides the cable length is too short, it may cause the excessive tension on the fixed points that will cause early disconnection. Use a flexible cable with the optimum length.

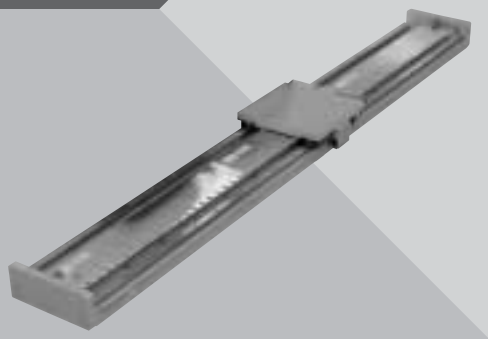
(4) Interference between cables

Avoid interference between cables.

Interference limits the motion of flexible cable, which causes early disconnection. Keep enough distance between cables, or provide a partition when wiring.

Linear Sliders

Σ-Trac



Model Designation

SGT 1 F3 1 - 030 A H 20 - 0

Σ-Trac Series
Linear Slider

Linear Slider Type
1 : Standard (Aluminum base)
2 : High-rigidity (Steel or iron base)

Mounted Linear Servomotor

Code	Moving Coil Model
F3	SGLFW-35A120A
F4	SGLFW-35A230A
F9	SGLFW-50A200B
FA	SGLFW-50A380B
GD	SGLGW-40A140C
GE	SGLGW-40A253C
GF	SGLGW-40A365C
GG	SGLGW-60A140C
GH	SGLGW-60A253C
GI	SGLGW-60A365C

Number of Tables (per Magnet Track)
1 : 1 table
2 : 2 tables
to
n : n tables

Effective Stroke
007 : 70 mm
to
195 : 1950 mm

Linear Scale Output Form
A : Analog output 1 Vp-p

Linear Scale Manufacturer
H : HEIDENHAIN Corporation
R : Renishaw plc.

Linear Scale Resolution
20 : 20 μm
04 : 4 μm

Surface Treatment
0 : Aluminum base; Clear anodized aluminum coating
Steel or iron base; Black paint
1 : Aluminum base; Black anodized aluminum coating
Steel or iron base; Electroless nickel plating or Raydent® processing

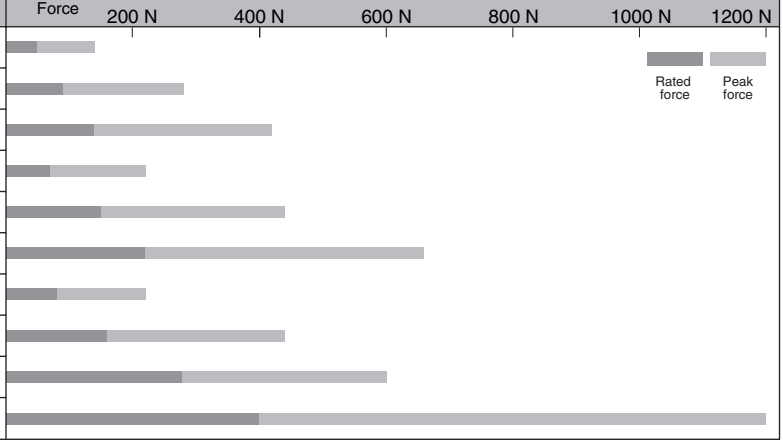
Features

- For long strokes and high-speed, high-accuracy positioning (repetitive positioning accuracy less than ±1.0 μm).
- Several tables can be mounted on one magnet track, and each table can be driven independently.
- Standard and high-precision models are available.

Model Classification

● Force

SERVOPACK Model SGDS-			Σ-Trac Series Linear Sliders	
Single-phase 100 VAC	Single-phase 200 VAC	Three-phase 200 VAC	Model No.	Force
01□□5A	01A□5A	–	SGT□GD□-□□□	
02□□5A	02A□5A	–	SGT□GE□-□□□	
04□□5A	04A□5A	–	SGT□GF□-□□□	
02F□5A	02A□5A	–	SGT□GG□-□□□	
04F□5A	04A□5A	–	SGT□GH□-□□□	
–	08A□5A	–	SGT□GI□-□□□	
02F05A	02A□5A	–	SGT□F3□-□□□	
–	–	05A□5A	SGT□F4□-□□□	
–	08A□5A	–	SGT□F9□-□□□	
–	–	15A□5A	SGT□FA□-□□□	



● Stroke Length

Model No.	Stroke Length
SGT□GD□-□□□	90 mm – 1300 mm
SGT□GE□-□□□	120 mm – 1200 mm
SGT□GF□-□□□	140 mm – 1080 mm
SGT□GG□-□□□	90 mm – 1300 mm
SGT□GH□-□□□	120 mm – 1200 mm
SGT□GI□-□□□	140 mm – 1080 mm
SGT□F3□-□□□	80 mm – 1950 mm
SGT□F4□-□□□	180 mm – 1830 mm
SGT□F9□-□□□	70 mm – 1830 mm
SGT□FA□-□□□	170 mm – 1650 mm

500 mm 1000 mm 1500 mm 2000 mm

Contact your Yaskawa representative for information on strokes other than those listed.

SGT□F3□ and SGT□F4□ Linear Sliders

● Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Protection Method: Self-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130℃ (Insulation class B)

Linear Slider Model*1		SGT□F3□-□□□AH20-0	SGT□F4□-□□□AH20-0
Mounted Linear Servomotor Model	SGLFW-	35A120AP	35A230AP
Applicable SERVOPACK Model	SGDS-	02□	05A
Applicable Serial Converter Unit Model	JZDP-	D006-019	D006-020
Rated Force	N	80	160
Peak Force	N	220	440
Force Constant	N/Arms	62.4	62.4
Motor Constant	$N/\sqrt{W}$	14.4	20.4
Maximum Payload*2, *3	kg	30	70
Movable Member Mass	kg	3.1	5.3
Total Mass	kg	See Table 1 on the next page.	See Table 2 on the next page.
Effective Stroke	mm		
Resolution	μm	0.078 (20 μm/256)	
Repeatability*4	μm	±1.0	±1.0

*1: Squares (□□□) are used to indicated the stroke length code shown in Tables 1 and 2.
*2: Values obtained when the acceleration is 4.9 m/s².
*3: Contact your Yaskawa representative if the expected payload exceeds the value indicated in the table.
*4: Values obtained when the surrounding air temperature is constant.

● Performance Curves

● Force - Speed

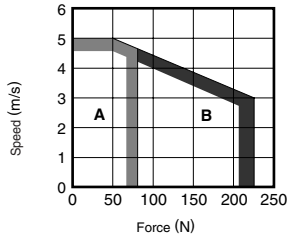
(A: Continuous Duty Zone B: Intermittent Duty Zone)

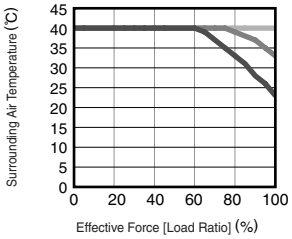
● Effective Force - Surrounding Air Temperature

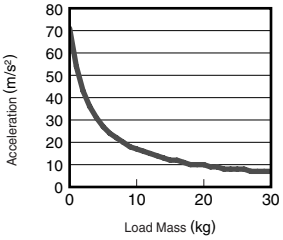
When the sensor temperature is 50 °C or less
Average speed (m/s): 0 — 1 — 2
Note: Average speed = Total movement distance (m) / cycle time (s)

● Load Mass - Acceleration

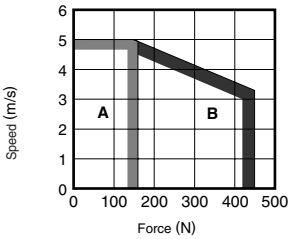
(1) SGT□F3□

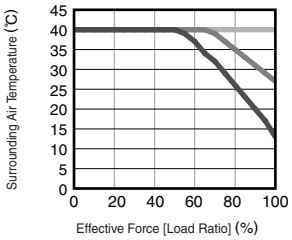


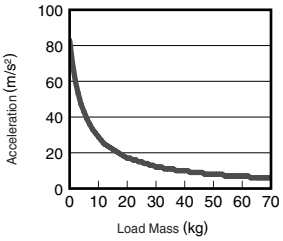




(2) SGT□F4□







SGT□F3□ and SGT□F4□ Linear Sliders Units: mm

● External Dimensions

(1) SGT□F31

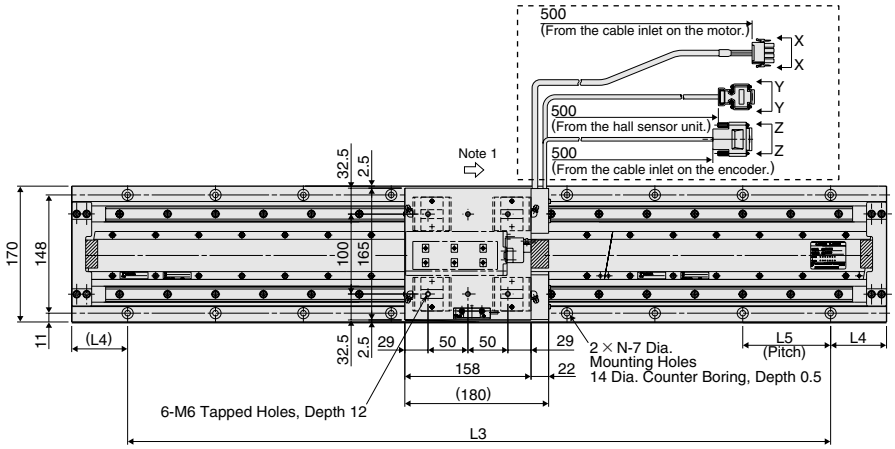
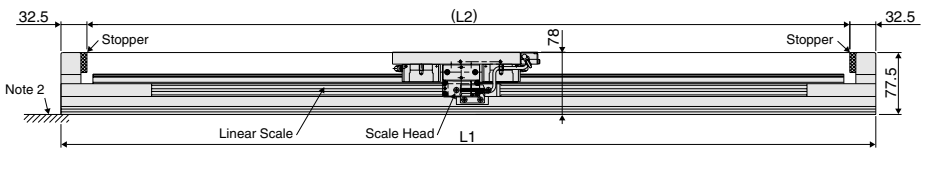
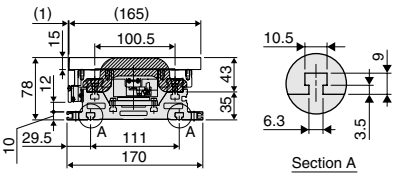


Table 1

Stroke Code	Stroke Length	L1	L2	L3	L4	L5	N	Total Mass kg
008	80	360	295	270	45	90	4	9.1
030	300	580	515	440			5	13.0
041	410	690	625	550			6	14.9
052	520	800	735	660			7	16.8
063	630	910	845	770			8	18.6
074	740	1020	955	880			9	20.5
085	850	1130	1065	990			10	22.5
096	960	1240	1175	1100			11	24.5
107	1070	1350	1285	1210	70	110	12	26.3
118	1180	1460	1395	1320			13	28.3
129	1290	1570	1505	1430			14	30.1
140	1400	1680	1615	1540			15	32.0
151	1510	1790	1725	1650			16	34.0
162	1620	1900	1835	1760			17	35.9
173	1730	2010	1945	1870			18	37.8
184	1840	2120	2055	1980			19	39.7
195	1950	2230	2165	2090			20	41.5





(2) SGT□F41

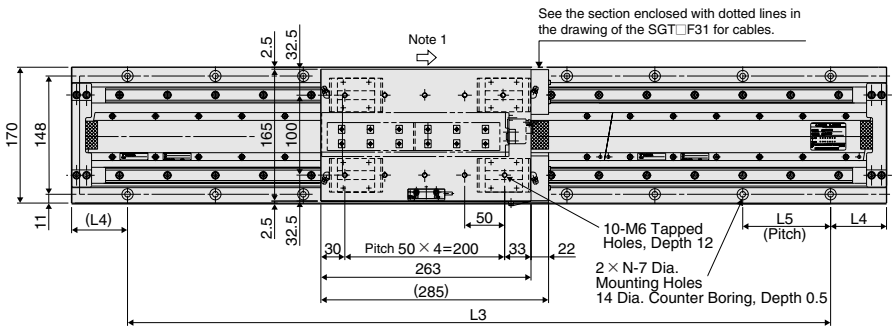
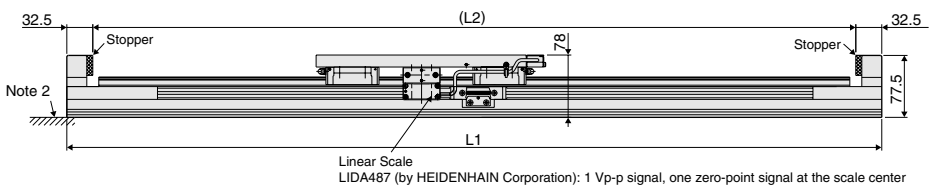
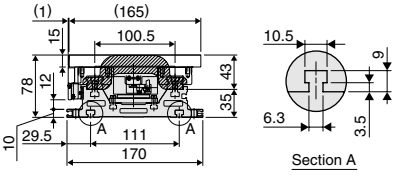


Table 2

Stroke Code	Stroke Length	L1	L2	L3	L4	L5	N	Total Mass kg
018	180	580	515	440			5	15.1
029	290	690	625	550			6	17.0
040	400	800	735	660			7	18.9
051	510	910	845	770			8	20.7
062	620	1020	955	880			9	22.7
073	730	1130	1065	990			10	24.6
084	840	1240	1175	1100			11	27.1
095	950	1350	1285	1210	70	110	12	28.5
106	1060	1460	1395	1320			13	30.4
117	1170	1570	1505	1430			14	32.2
128	1280	1680	1615	1540			15	34.2
139	1390	1790	1725	1650			16	36.1
150	1500	1900	1835	1760			17	38.1
161	1610	2010	1945	1870			18	39.9
172	1720	2120	2055	1980			19	41.9
183	1830	2230	2165	2090			20	42.6





Notes: 1 The moving coil moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.
2 When installing the linear slider, the surface should be flat to the equivalent of a maximum discrepancy of 0.02/200 mm (reference value).

・Connector Specifications for the Σ -Trac Series Linear Sliders (All Models)

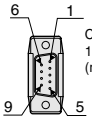
View X-X

Plug: 350779-1 (by Tyco Electronics AMP K.K.)
Pins: 350924-1 or 770672-1 (by Tyco Electronics AMP K.K.)

For Motor Cable

Pin No.	Signal
1	Phase-U output
2	Phase-V output
3	Phase-W output
4	FG

View Y-Y

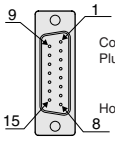


Connector (Socket): 17JE-23090-02 (D8C) (made by DDK)

For Hall Sensor Cable

Pin No.	Signal	Pin No.	Signal
1	+5 V (power supply)	6	Not used
2	Phase-U output	7	Not used
3	Phase-V output	8	Not used
4	Phase-W output	9	Not used
5	0 V (power supply)	Case	Shield

View Z-Z



Connector Plug: 205206-3 (by Tyco Electronics AMP K.K.)
Housing: 745172-3 (by Tyco Electronics AMP K.K.)

For Encoder Cable

Pin No.	Signal	Pin No.	Signal
1	Cos output (A+)	9	/Cos output (A-)
2	0 V	10	0 V sensor
3	Sin output (B+)	11	/Sin output (B-)
4	+5 V	12	5 V sensor
5	Not used	13	Not used
6	Not used	14	Ref(R+)
7	/Ref(R-)	15	Not used
8	Not used	Case	Shield

SGT□F9□ and SGT□FA□ Linear Sliders

● Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Protection Method: Self-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130℃ (Insulation class B)

Linear Slider Model*1		SGT□F9□-□□□AH20-0	SGT1FA□-□□□AH20-0
Mounted Linear Servomotor Model SGLFW-		50A200BP	50A380BP
Applicable SERVOPACK Model	SGDS-	08A	15A
Applicable Serial Converter Unit Model	JZDP-	D006-181	D006-182
Rated Force	N	280	560
Peak Force	N	600	1200
Force Constant	N/Arms	60.2	60.2
Motor Constant	$N/\sqrt{W}$	34.3	48.5
Maximum Payload*2, *3	kg	100	215
Movable Member Mass	kg	7.2	12.9
Total Mass	kg	See Table 1 on the next page.	See Table 2 on the next page.
Effective Stroke	mm		
Resolution	μm	0.078 (20 μm/256)	
Repeatability*4	μm	±1.0	±1.0

*1: Squares (□□□) are used to indicated the stroke length code shown in Tables 1 and 2.
*2: Values obtained when the acceleration is 4.9 m/s².
*3: Contact your Yaskawa representative if the expected payload exceeds the value indicated in the table.
*4: Values obtained when the surrounding air temperature is constant.

● Performance Curves

● Force - Speed

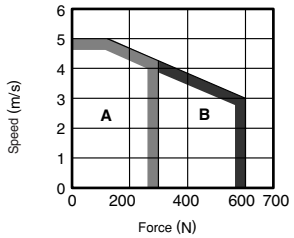
(A : Continuous Duty Zone B : Intermittent Duty Zone)

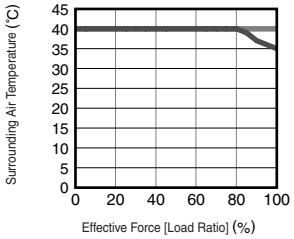
● Effective Force - Surrounding Air Temperature

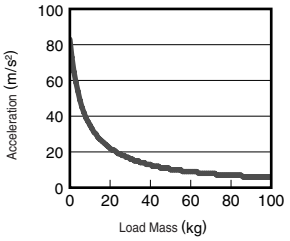
When the sensor temperature is 50 °C or less
Average speed (m/s) : 0 — 1 — 2
Note: Average speed = Total movement distance (m) / cycle time (s)

● Load Mass - Acceleration

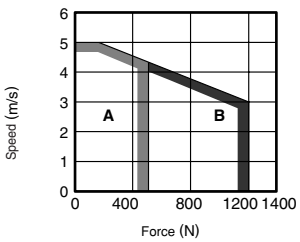
(1) SGT□F9□

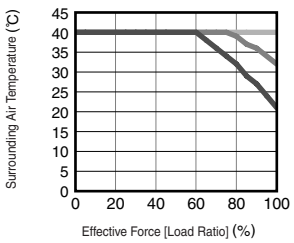


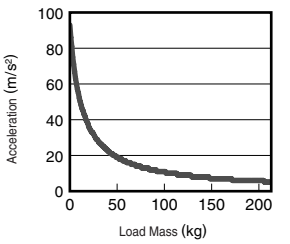




(2) SGT□FA□







SGT□F9□ and SGT□FA□ Linear Sliders Units: mm

● External Dimensions

(1) SGT□F91

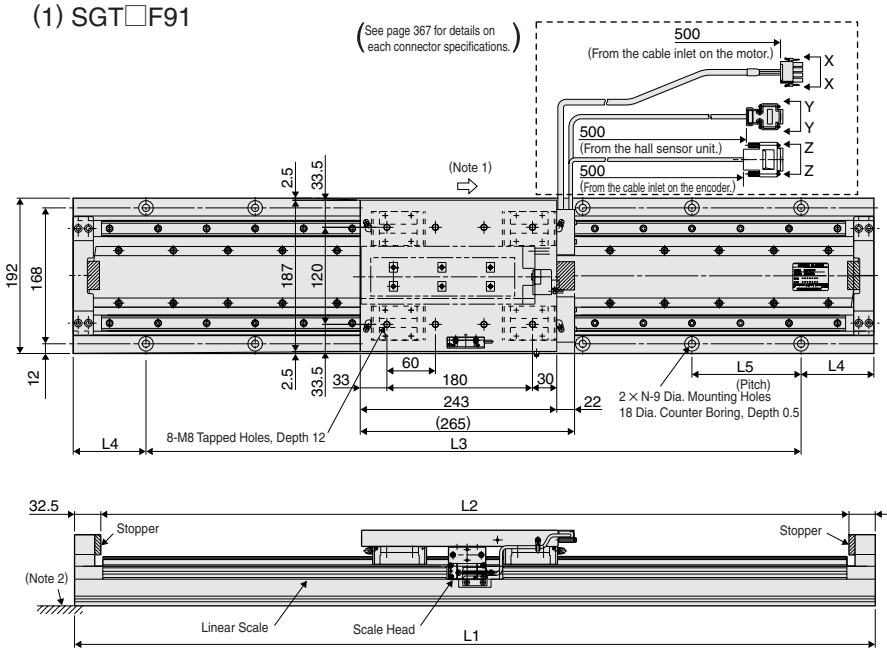


Table 1

Stroke Code	Stroke Length	L1	L2	L3	L4	L5	N	Total Mass kg
007	70	440	375	300	70	100	4	15.9
035	350	720	655	540	90	135	5	21.3
048	480	850	785	675	87.5		6	24.1
062	620	990	925	810	90		7	26.9
075	750	1120	1055	945	87.5		8	29.5
089	890	1260	1195	1080	90		9	32.2
102	1020	1390	1325	1215	87.5		10	35.0
116	1160	1530	1465	1350	90		11	37.7
129	1290	1660	1595	1485	87.5		12	40.3
143	1430	1800	1735	1620	90		13	43.0
156	1560	1930	1865	1755	87.5		14	45.8
170	1700	2070	2005	1890	90		15	48.5
183	1830	2200	2135	2025	87.5		16	51.2

(2) SGT□FA1

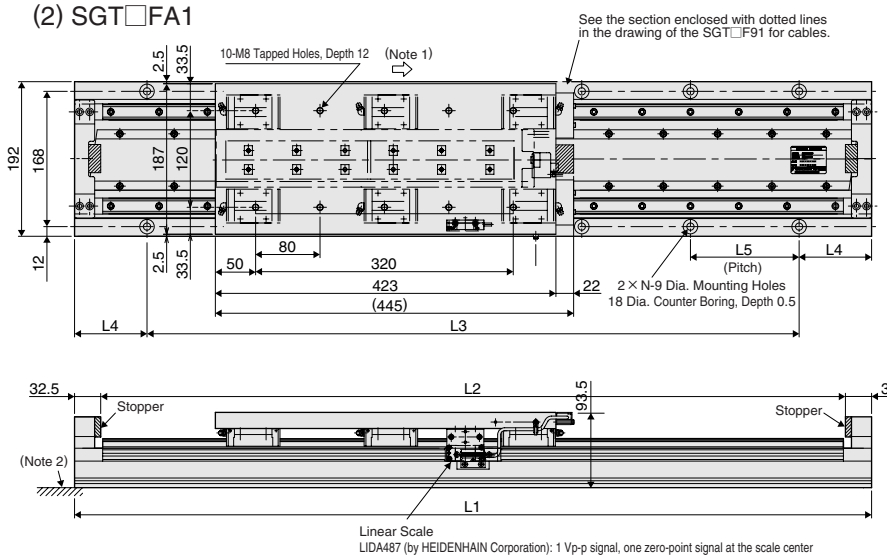


Table 2

Stroke Code	Stroke Length	L1	L2	L3	L4	L5	N	Total Mass kg
017	170	720	655	540	90	135	5	27.0
030	300	850	785	675	87.5		6	29.8
044	440	990	925	810	90		7	32.6
057	570	1120	1055	945	87.5		8	35.2
071	710	1260	1195	1080	90		9	37.9
084	840	1390	1325	1215	87.5		10	40.7
098	980	1530	1465	1350	90		11	43.4
111	1110	1660	1595	1485	87.5		12	46.0
125	1250	1800	1735	1620	90		13	48.7
138	1380	1930	1865	1755	87.5		14	51.5
152	1520	2070	2005	1890	90		15	54.2
165	1650	2200	2135	2025	87.5		16	56.9

Notes: 1 The moving coil moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.
2 When installing the linear slider, the surface should be flat to the equivalent of a maximum discrepancy of 0.02/200 mm (reference value).

SGT□GD□, SGT□GE□, and SGT□GF□ Linear Sliders

● Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Protection Method: Self-cooled, fan-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130℃ (Insulation class B)

Linear Slider Model*1		SGT□GD□-□□□AH20-0	SGT□GE□-□□□AH20-0	SGT□GF□-□□□AH20-0
Mounted Linear Servomotor Model	SGLGW-	40A140CP	40A253CP	40A365CP
Applicable SERVOPACK Model	SGDS-	01□	02□	04□
Applicable Serial Converter Unit Model	JZDP-	D006-252	D006-253	D006-254
Rated Force	N	47	93	140
Peak Force	N	140	280	420
Force Constant	N/Arms	61.5	61.5	61.5
Motor Constant	N/√W	7.8	11	13.5
Maximum Payload*2, *3	kg	25	50	80
Movable Member Mass	kg	2.8	3.7	5.5
Total Mass	kg	See Table 1 on the next page.		
Effective Stroke	mm			
Resolution	μm	0.078 (20 μm/256)		
Repeatability*4	μm	±1.0	±1.0	±1.0

*1: Squares (□□□) are used to indicated the stroke length code shown in Table 1.
*2: Values obtained when the acceleration is 4.9 m/s².
*3: Contact your Yaskawa representative if the expected payload exceeds the value indicated in the table.
*4: Values obtained when the surrounding air temperature is constant.

● Performance Curves

● Force - Speed

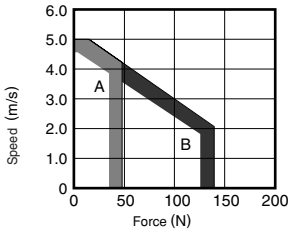
(A : Continuous Duty Zone B : Intermittent Duty Zone)

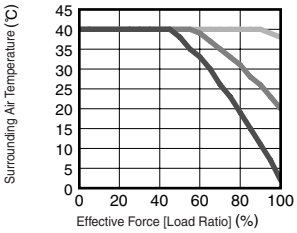
● Effective Force - Surrounding Air Temperature

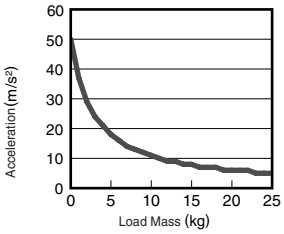
When the sensor temperature is 50 °C or less
Average speed (m/s) : 0 — 1 — 2 —
Note: Average speed = Total movement distance (m) / cycle time (s)

● Load Mass - Acceleration

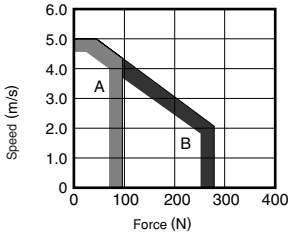
(1) SGT□GD□

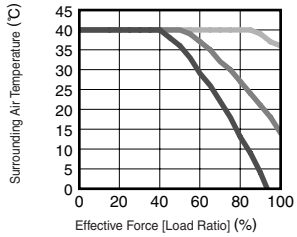


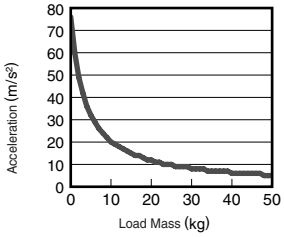




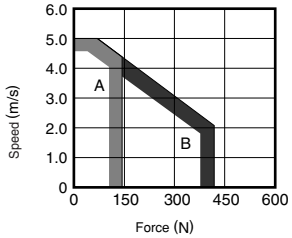
(2) SGT□GE□

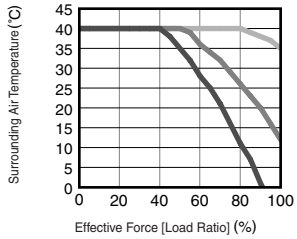


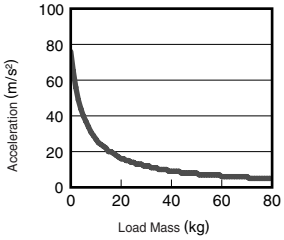




(3) SGT□GF□







SGT□GD□, SGT□GE□, and SGT□GF□ Linear Sliders Units: mm

● External Dimensions

<Table Side View>

・SGT□GD1 ・SGT□GE1 ・SGT□GF1

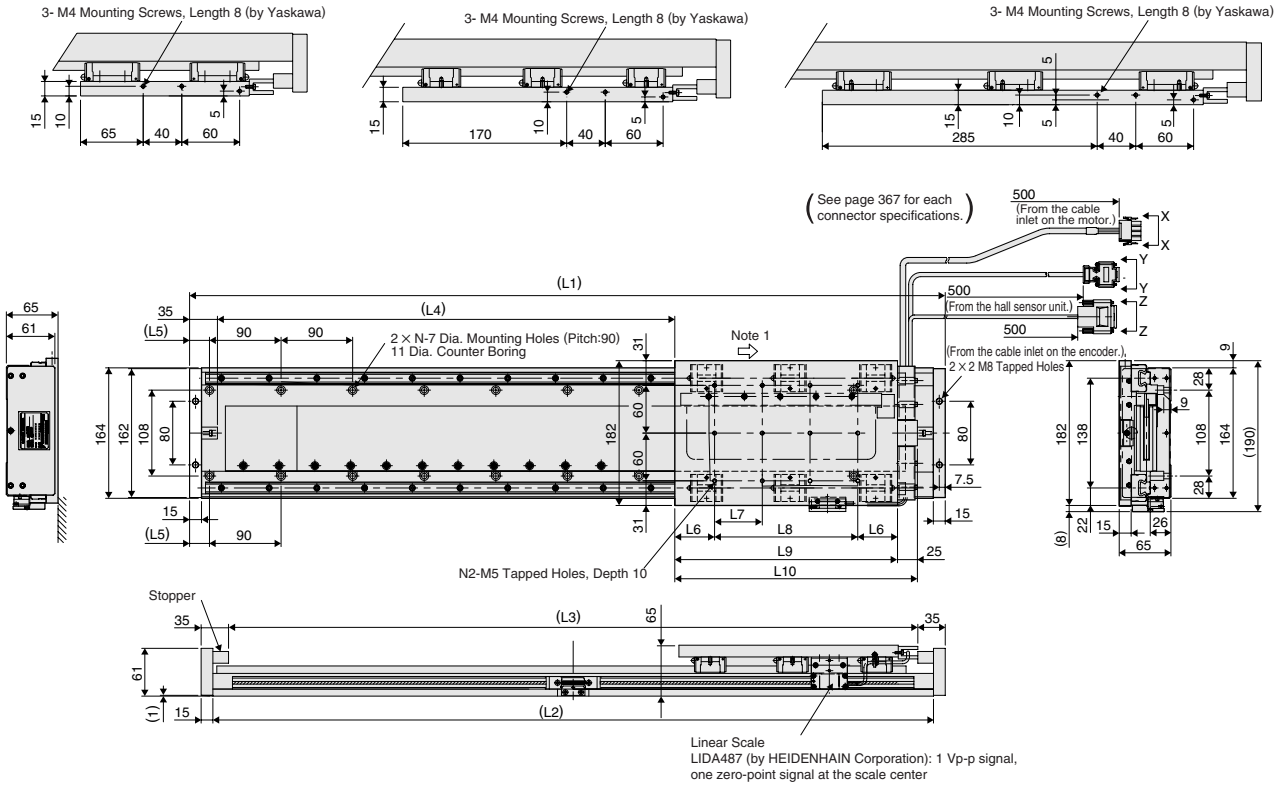


Table 1

Linear Slider Model (Mounted Linear Servomotor Model)	Stroke		Dimensions										N	N2	Total Mass kg
	Code	Length	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10			
SGT□GD1-□□□*AH20-0 (SGLGW-40A140CP)	009	90	410	380	340	140	25	32.5	55	110	175	200	5	9	12.3
	022	220	545	515	475	275	47.5						6		15.3
	036	360	680	650	610	410	25						8		18.4
	049	490	815	785	745	545	47.5						9		21.5
	063	630	950	920	880	680	25						11		24.5
	076	760	1085	1055	1015	815	47.5						12		27.6
	090	900	1220	1190	1150	950	25						14		30.6
	103	1030	1355	1325	1285	1085	47.5						15		33.7
	117	1170	1490	1460	1420	1220	25						17		36.8
	130	1300	1625	1595	1555	1355	47.5						18		39.8
SGT□GE1-□□□*AH20-0 (SGLGW-40A253CP)	012	120	545	515	475	170	47.5	50	60	180	280	305	6	12	16.8
	025	250	680	650	610	305	25						8		19.9
	039	390	815	785	745	440	47.5						9		22.9
	052	520	950	920	880	575	25						11		26.0
	066	660	1085	1055	1015	710	47.5						12		29.0
	079	790	1220	1190	1150	845	25						14		32.1
	093	930	1355	1325	1285	980	47.5						15		35.2
	106	1060	1490	1460	1420	1115	25						17		38.2
	110	1100	1535	1505	1465	1160	47.5						17		39.3
	120	1200	1625	1595	1555	1250	47.5						18		41.3
SGT□GF1-□□□*AH20-0 (SGLGW-40A365CP)	014	140	680	650	610	190	25	47.5	60	300	395	420	8	18	21.1
	027	270	815	785	745	325	47.5						9		24.2
	041	410	950	920	880	460	25						11		27.3
	054	540	1085	1055	1015	595	47.5						12		30.3
	068	680	1220	1190	1150	730	25						14		33.4
	081	810	1355	1325	1285	865	47.5						15		36.4
	095	950	1490	1460	1420	1000	25						17		39.5
	108	1080	1625	1595	1555	1135	47.5						18		42.6

∗: Squares (□□□) are used to indicated the stroke length code shown in Table 1.

Notes: 1 The moving coil moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

2 When installing the linear slider, the surface should be flat to the equivalent of a maximum discrepancy of 0.02/200 mm (reference value).

SGT□GG□, SGT□GH□, and SGT□GI□ Linear Sliders

● Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0℃ to 40℃
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Protection Method: Self-cooled, fan-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130℃ (Insulation class B)

Linear Slider Model*1		SGT□GG□-□□□AH20-0	SGT□GH□-□□□AH20-0	SGT□GI□-□□□AH20-0
Mounted Linear Servomotor Model SGLGW-		60A140CP	60A253CP	60A365CP
Applicable SERVOPACK Model SGDS-		02□	04□	08□
Applicable Serial Converter Unit Model JZDP-		D006-258	D006-259	D006-260
Rated Force	N	70	140	210
Peak Force	N	220	440	660
Force Constant	N/Arms	66.6	66.6	66.6
Motor Constant	N/√W	11.1	15.7	19.2
Maximum Payload*2, *3	kg	40	80	110
Movable Member Mass	kg	2.9	3.9	5.7
Total Mass	kg	See Table 1 on the next page.		
Effective Stroke	mm			
Resolution	μm	0.078 (20 μm/256)		
Repeatability*4	μm	±1.0	±1.0	±1.0

*1: Squares (□□□) are used to indicated the stroke length code shown in Table 1.
*2: Values obtained when the acceleration is 4.9 m/s².
*3: Contact your Yaskawa representative if the expected payload exceeds the value indicated in the table.
*4: Values obtained when the surrounding air temperature is constant.

● Performance Curves

● Force-Speed

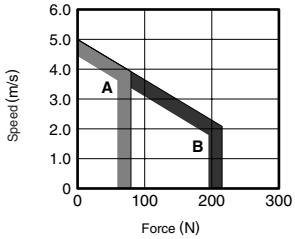
(A : Continuous Duty Zone B: Intermittent Duty Zone)

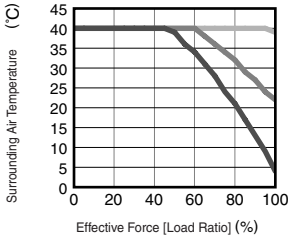
● Effective Force - Surrounding Air Temperature

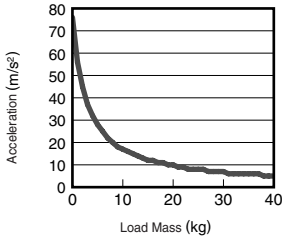
When the sensor temperature is 50℃ or less
Average speed (m/s): 0 — 1 — 2
Note: Average speed = Total movement distance (m) / cycle time (s)

● Load Mass-Acceleration

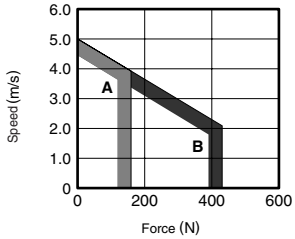
(1) SGT□GG□

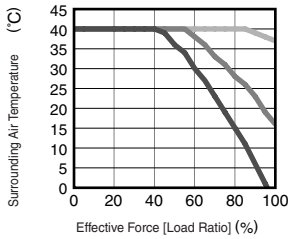


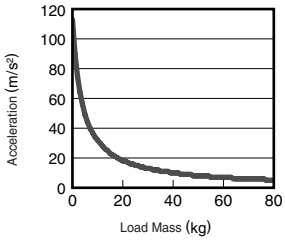




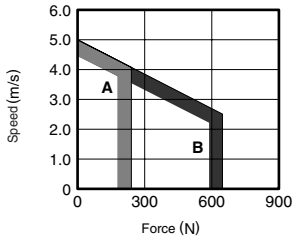
(2) SGT□GH□

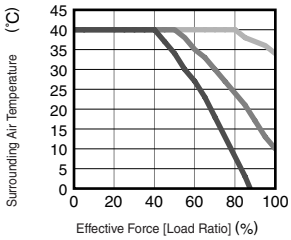


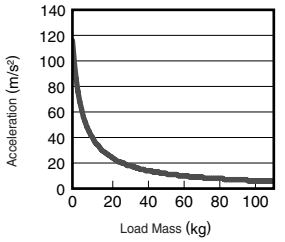




(3) SGT□GI□







SGT□GG□, SGT□GH□, and SGT□GI□ Linear Sliders Units: mm

● External Dimensions

<Table Side View>

・SGT□GG1 ・SGT□GH1 ・SGT□GI1

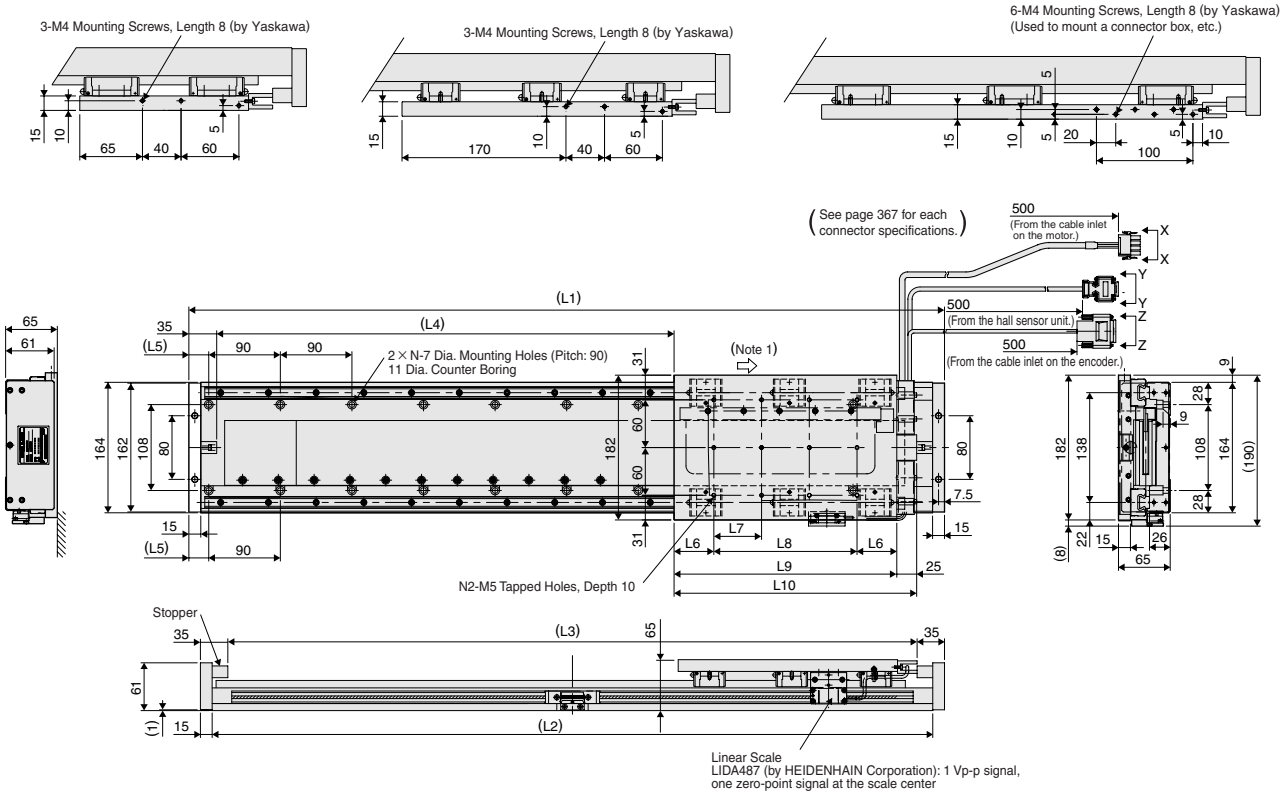


Table 1

Linear Slider Model (Mounted Linear Servomotor Model)	Stroke		Dimensions										N	N2	Total Mass kg
	Code	Length	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10			
SGT□GG1-□□□*AH20-0 (SGLGW-60A140CP)	009	90	410	380	340	140	25	32.5	55	110	175	200	5	9	12.3
	022	220	545	515	475	275	47.5						6		15.4
	036	360	680	650	610	410	25						8		18.5
	049	490	815	785	745	545	47.5						9		21.5
	063	630	950	920	880	680	25						11		24.6
	076	760	1085	1055	1015	815	47.5						12		27.7
	090	900	1220	1190	1150	950	25						14		30.7
	103	1030	1355	1325	1285	1085	47.5						15		33.8
	117	1170	1490	1460	1420	1220	25						17		36.9
	130	1300	1625	1595	1555	1355	47.5						18		39.9
SGT□GH1-□□□*AH20-0 (SGLGW-60A253CP)	012	120	545	515	475	170	47.5	50	60	180	280	305	6	12	17.0
	025	250	680	650	610	305	25						8		20.0
	039	390	815	785	745	440	47.5						9		23.1
	052	520	950	920	880	575	25						11		26.1
	066	660	1085	1055	1015	710	47.5						12		29.2
	079	790	1220	1190	1150	845	25						14		32.3
	093	930	1355	1325	1285	980	47.5						15		35.3
	106	1060	1490	1460	1420	1115	25						17		38.4
	110	1100	1535	1505	1465	1160	47.5						17		39.4
	120	1200	1625	1595	1555	1250	47.5						18		41.5
SGT□GI1-□□□*AH20-0 (SGLGW-60A365CP)	014	140	680	650	610	190	25	47.5	60	300	395	420	8	18	21.4
	027	270	815	785	745	325	47.5						9		24.4
	041	410	950	920	880	460	25						11		27.5
	054	540	1085	1055	1015	595	47.5						12		30.5
	068	680	1220	1190	1150	730	25						14		33.6
	081	810	1355	1325	1285	865	47.5						15		36.7
	095	950	1490	1460	1420	1000	25						17		39.7
	108	1080	1625	1595	1555	1135	47.5						18		42.8

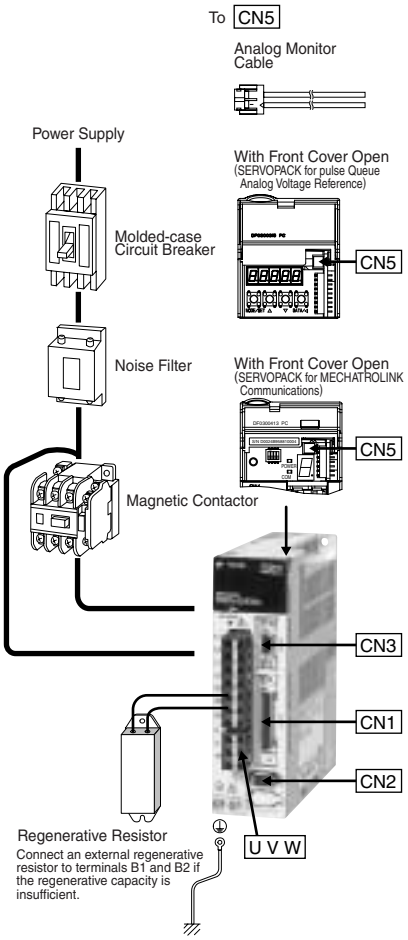
*: Squares (□□□) are used to indicated the stroke length code shown in Table 1.

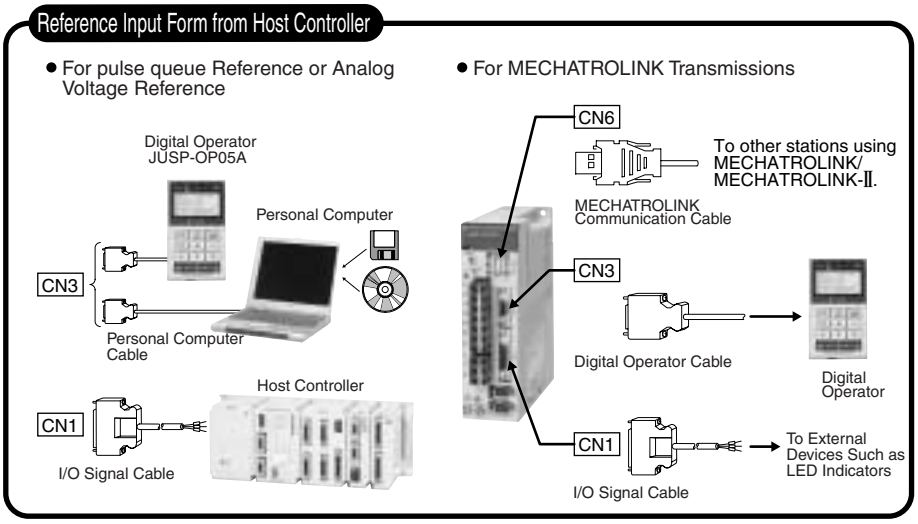
Notes: 1 The moving coil moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

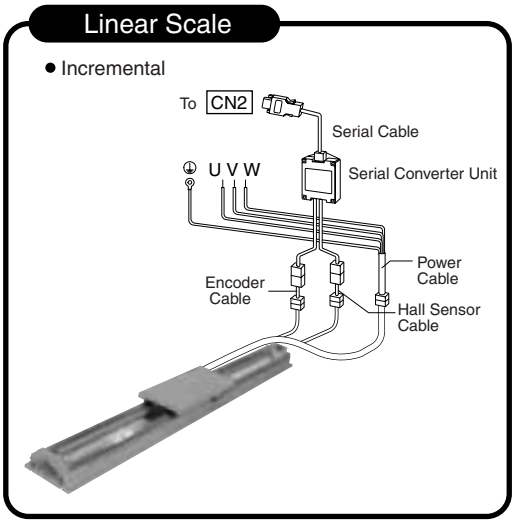
2 When installing the linear slider, the surface should be flat to the equivalent of a maximum discrepancy of 0.02/200 mm (reference value).

Selecting Cables and Connectors

● Peripheral Devices







● Applicable Cables and Connectors

Motor Type	Linear Scale Type	AC Servo Drive				Motor Cable	Linear-scale Connection Cables		
			SERVOPACK Model SGDS-*1			SERVOPACK ↔ Motor	Serial Converter Unit Model JZDP-*2	[CN2] ↔ Serial Converter Unit	Serial Converter Unit ↔ External Encoder
		Σ-Trac Series Model	Single-phase 100 V	Single-phase 200 V	Three-phase 200 V	Power Cable (Flexible Type)		Serial Cable (Flexible Type)	Encoder Cable (Flexible Type)
Moving Coil (MC)	Incremental	SGT□F3□-□□□AH20-0	02F□5A	02A□5A	–	JZSP-CLN11-□□-E	D006-019	JZSP-CLP70-□□-E	JZSP-CLL00-□□-E
		SGT□F4□-□□□AH20-0	–	–	05A□5A	JZSP-CLN11-□□-E	D006-020		
		SGT□F9□-□□□AH20-0	–	08A□5A	–	JZSP-CLN21-□□-E	D006-181	□□indicates the length of the cable. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m 20 = 20 m	□□indicates the length of the cable. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m 20 = 20 m
		SGT□FA□-□□□AH20-0	–	–	15A□5A	JZSP-CLN21-□□-E	D006-182		
		SGT□GD□-□□□AH20-0	01F□5A	01A□5A	–	JZSP-CLN11-□□-E	D006-252		
		SGT□GE□-□□□AH20-0	02F□5A	02A□5A	–	JZSP-CLN11-□□-E	D006-253		
		SGT□GF□-□□□AH20-0	04F□5A	04A□5A	–	JZSP-CLN11-□□-E	D006-254		
		SGT□GG□-□□□AH20-0	02F□5A	02A□5A	–	JZSP-CLN11-□□-E	D006-258		
		SGT□GH□-□□□AH20-0	04F□5A	04A□5A	–	JZSP-CLN11-□□-E	D006-259		
		SGT□GI□-□□□AH20-0	–	08A□5A	–	JZSP-CLN11-□□-E	D006-260		

*1: The code shown in the squares (□) varies in accordance with the reference.
*2: If you are ordering RoHS compliant products, add "-E" on the end of the model name.

Selecting Cables and Connectors

● Applicable Peripheral Devices

Main-circuit Power Supply	SERVOPACK Capacity W	SERVOPACK Model SGDS-	Digital Operator Model	Molded-case Circuit Breaker: Power Supply Capacity per SERVOPACK	Molded-case Circuit Breaker: MCCB/Fuse Capacity (Note 1)	Noise Filter (Recommended)	Magnetic Contactor	Surge Protector	AC/DC Reactor
Single-phase 100 V	100	01F	JUSP-OP05A with a 1 m cable	0.40 kVA	4 Arms	FN2070-6/07 (Single-phase 250 VAC, 6 A)	SC-03	R·C·M-601BQZ-4	X5053
	200	02F		0.60 kVA	6 Arms	FN2070-10/07 (Single-phase 250 VAC, 10 A)			X5054
	400	04F		1.2 kVA	12 Arms	FN2070-16/07 (Single-phase 250 VAC, 16 A)	SC-4-1		X5056
Single-phase 200 V	100	01A		0.40 kVA	4 Arms	FN2070-6/07 (Single-phase 250 VAC, 6 A)	SC-03		X5052
	200	02A		0.75 kVA					X5053
	400	04A		1.2 kVA	8 Arms	FN2070-10/07 (Single-phase 250 VAC, 10 A)			X5054
	750	08A*1		2.2 kVA	16 Arms	FN2070-16/07 (Single-phase 250 VAC, 16 A)	SC-4-1		X5056
Three-phase 200 V	500	05A*2		1.4 kVA	4 Arms	FN258L-7/07 (Three-phase 480 VAC, 7A)	SC-03	R·C·M-601BUZ-4	X5061
	1500	15A*3		3.2 kVA	10 Arms	FN258L-16/07 (Three-phase 480 VAC, 16A)	SC-4-1		X5060

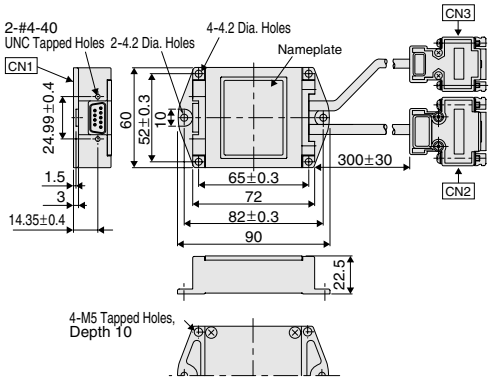
*1: With a built-in regenerative resistor (resistance: 50 Ω, capacity: 60 W)
*2: With a built-in regenerative resistor (resistance: 50 Ω, capacity: 40 W)
*3: With a built-in regenerative resistor (resistance 30 Ω, capacity 70 W)

Notes: 1 Nominal value at the rated load. The specified derating is required to select an appropriate fuse capacity. Cut-off characteristics (at 25°C) is 200% for two seconds min. and 700% for 0.01 seconds min.
- Do not use a fast-acting fuse. Because the SERVOPACK's power supply is a capacitor input type, a fast-acting fuse may blow when the power is turned on.
- The SGDS SERVOPACK does not include a protective circuit for grounding. To protect the system, install a ground-fault detector against overloads and short circuits or install a protective ground-fault detector combined with the molded-case circuit breaker for grounding.

2 The following peripheral devices are manufactured by:
- Noise filter: Schaffner EMC,Inc.
- Magnetic contactor: Fuji Electric FA Components & Systems Co., Ltd.
- Surge absorber: Okaya Electric Industries Co., Ltd. (Surge Protector)
- AC/DC reactor: Yaskawa Controls Co., Ltd.

● Detail Drawings: Serial Converter Units for Linear Scales by HEIDENHAIN Corporation

● With Cable for Hall Sensor
JZDP-D006-□□□
JZDP-D006-□□□-E(RoHS compliant)

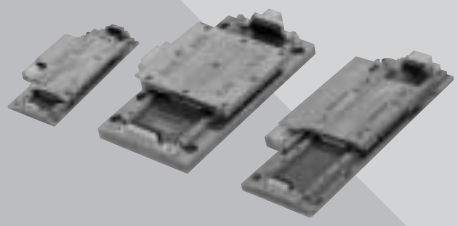


Note: For details on connectors, refer to page 360.

	Pulse Queue or Analog Voltage Reference			MECHATROLINK Communications			Cables for Setting Devices/Monitors	
Serial Converter Unit↔Hall Sensor	I/O Signal Connector [CN1]			I/O Signal Connector [CN1]		MECHATROLINK Communication Connector [CN6A] or [CN6B]	[CN3]↔Setting Devices	[CN5]
Hall Sensor Cable (Flexible Type)	Connector Terminal Block Converter Unit	Cable with Loose Wires at One End	Connector Kit [CN1]	Connector Terminal Block Converter Cable	Connector Kit [CN1]		Personal Computer Cable	Analog Monitor Cable
JZSP-CLL10-□□-E □□ indicates the length of the cable. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m 20 = 20 m	JUSP-TA50PG-E (with a 0.5 m cable)	JZSP-CSI01-□-E □indicates the length of the cable. 1 = 1 m 2 = 2 m 3 = 3 m	JZSP-CSI9-1-E	JZSP-TA26P-□-E	JZSP-CSI9-2-E (DE9411354)	MECHATROLINK communications cable JEPMC-W6002-□□-E □□ indicates the length of the cable. A5 = 0.5 m, 01 = 1 m, 03 = 3 m, 05 = 5 m, 10 = 10 m, 20 = 20 m, 30 = 30 m, 40 = 40 m, 50 = 50 m MECHATROLINK terminator JEPMC-W6022-E	JZDP-CMS02-E (2 m)	JZSP-CA01-E (1 m)

Linear Sliders

Σ-Trac-μ



Model Designation

SGT M M 03 - 065 A H 20 A P

- SGT: Σ-Trac Series Linear Slider
- M: Moving Magnet Type
- M: Integrally Molded Armature Type
- 03: Peak Force
  - 03 : 25 N
  - 01 : 10 N
- 065: Effective Stroke
  - 010 : 10 mm
  - 025 : 25 mm
  - 030 : 30 mm
  - 065 : 65 mm
- A: Linear Scale Output Form
  - A : Analog output 1 Vp-p
- H: Linear Scale Manufacturer
  - H : HEIDENHAIN Corporation
  - M : MicroE International Inc.
- 20: Linear Scale Resolution
  - 20 : 20 μm
  - 04 : 4 μm
- A: Design Revision Order
  - A, B, C, ...
- P: Options
  - P : With hall sensor

Features

- Ultra-flat profile reduces floorspace requirements.
- For applications requiring short strokes (10 mm to 65 mm)
- Vibration-free transmission device enables high-precision positioning with a repetitive positioning accuracy of ±0.5 μm max.
- Locations of armature coils on fixed side of the stationary member reduce effects of heat on table or workpiece.

Application Examples

- Semiconductor mounters
- Equipment for biomedical
- Optical testing devices

Model Classification

● Force

SERVOPACK Model SGDS-			Σ-Trac-μ Series Linear Sliders	
Single-phase 100 VAC	Single-phase 200 VAC	Three-phase 200 VAC	Model	Force 10 N 20 N 30 N
A5F□5A	A5A□5A	–	SGTMM01	
01F□5A	01A□5A	–	SGTMM03	Rated force / Peak force

● Stroke Length

Linear Slider Model	Stroke Length 50 mm 100 mm 150 mm 200 mm
SGTMM01	● 10 mm ● 30 mm
SGTMM03	● 25 mm ● 65 mm

● Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0 ˚C to 40 ˚C

Excitation: Permanent magnet
Dielectric Strength: 1500 VAC for one minute
Protection Method: Self-cooled

Ambient Humidity: 20 % to 80 % (no condensation)
Allowable Winding Temperature: 130 ˚C (Insulation class B)

Linear Slider Model		SGTMM01-010AM20A	SGTMM01-030AM20A	SGTMM03-025AH20AP	SGTMM03-025AH04AP	SGTMM03-065AH20A□	SGTMM03-065AH04AP
Applicable SERVOPACK Model	SGDS-	A5A	A5A	01A	01A	01A	01A
Applicable Serial Converter Unit Model	JZDP-	D003-242		D00□-221		D00□-220	
Rated Force	N	3.5	3.5	7	7	7	7
Peak Force	N	10	10	25	25	25	25
Force Constant	N/Arms	9	9	13.2	13.2	12.3	12.3
Motor Constant	$N/\sqrt{W}$	1.78	1.26	2.29	2.29	1.58	1.58
Maximum Payload*1	kg	1	1	3	3	3	3
Effective Stroke	mm	10	30	25	25	65	65
Resolution	μm	0.078 (20 μm/256)			0.016 (4 μm/256)	0.078 (20 μm/256)	0.016 (4 μm/256)
Movable Member Mass	kg	0.1	0.1	0.215	0.215	0.19	0.19
Total Mass (excluding cables)	kg	0.35	0.31	0.62	0.62	0.63	0.63
Repeatability*2	μm	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5

*1: Values obtained when the acceleration is 4.9 m/s².
*2: Values obtained when the surrounding air temperature is constant.

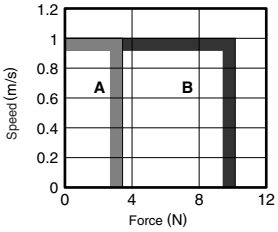
● Performance Curves

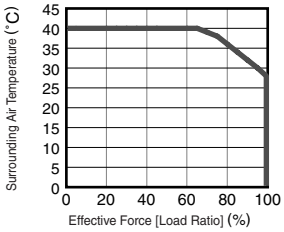
● Force - Speed
(A : Continuous Duty Zone B : Intermittent Duty Zone)

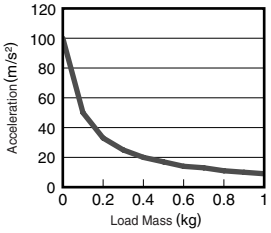
● Effective Force - Surrounding Air Temperature
When the sensor temperature is 50 ˚C or less.
Surrounding air temperature

● Load Mass - Acceleration

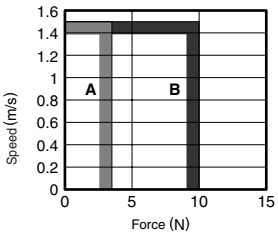
(1) SGTMM01-010

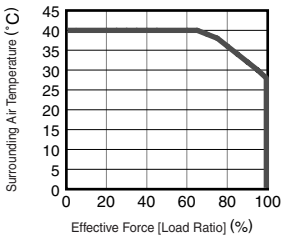


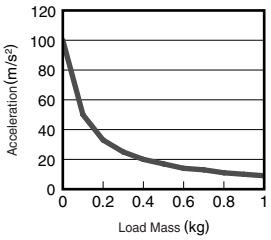




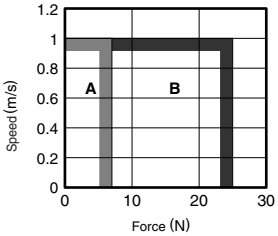
(2) SGTMM01-030

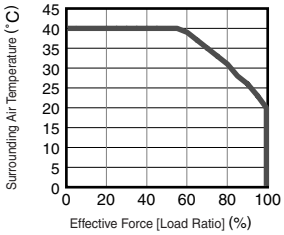


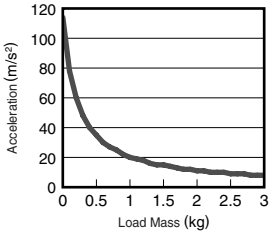




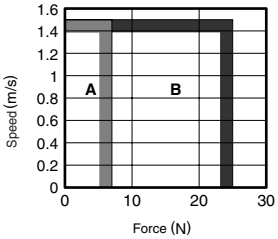
(3) SGTMM03-025

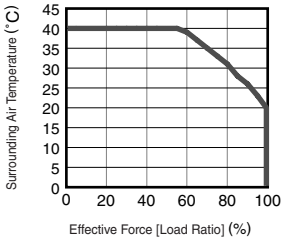


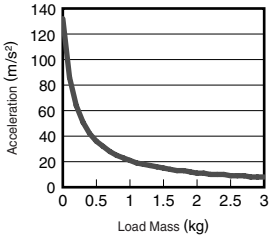




(4) SGTMM03-065



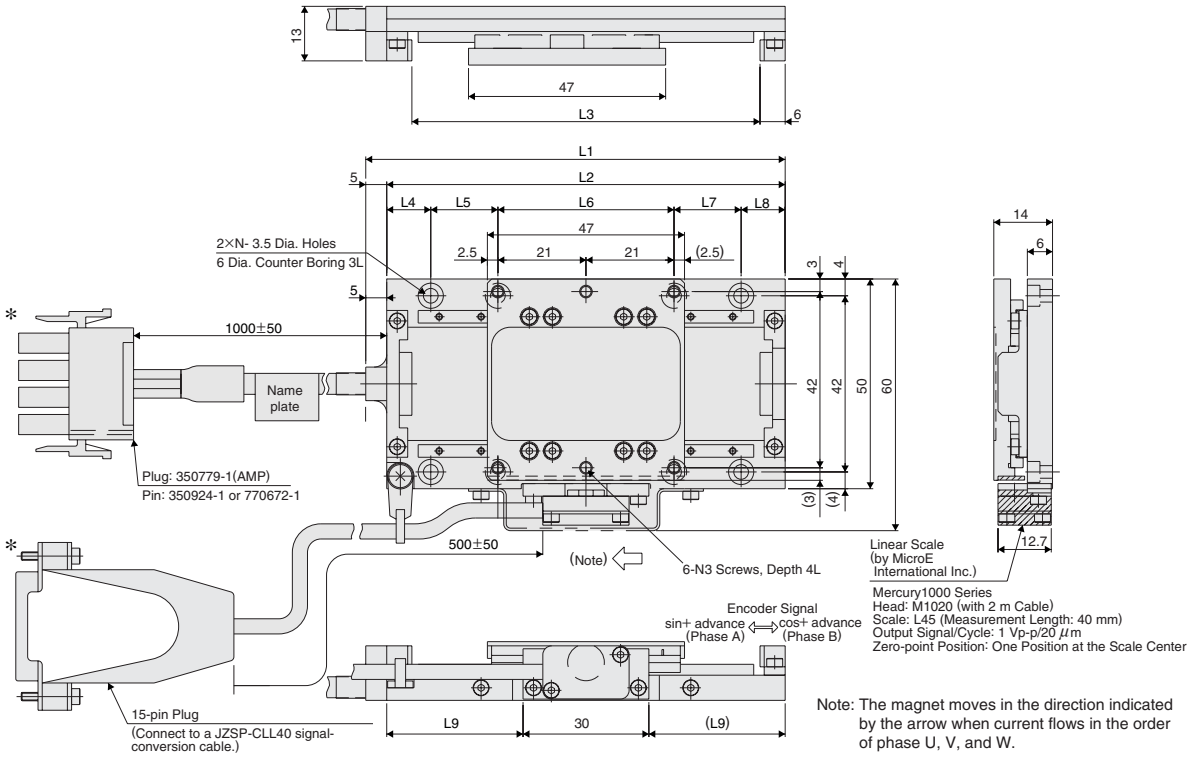




SGTMM Linear Sliders Units: mm

- External Dimensions

(1) SGTMM01

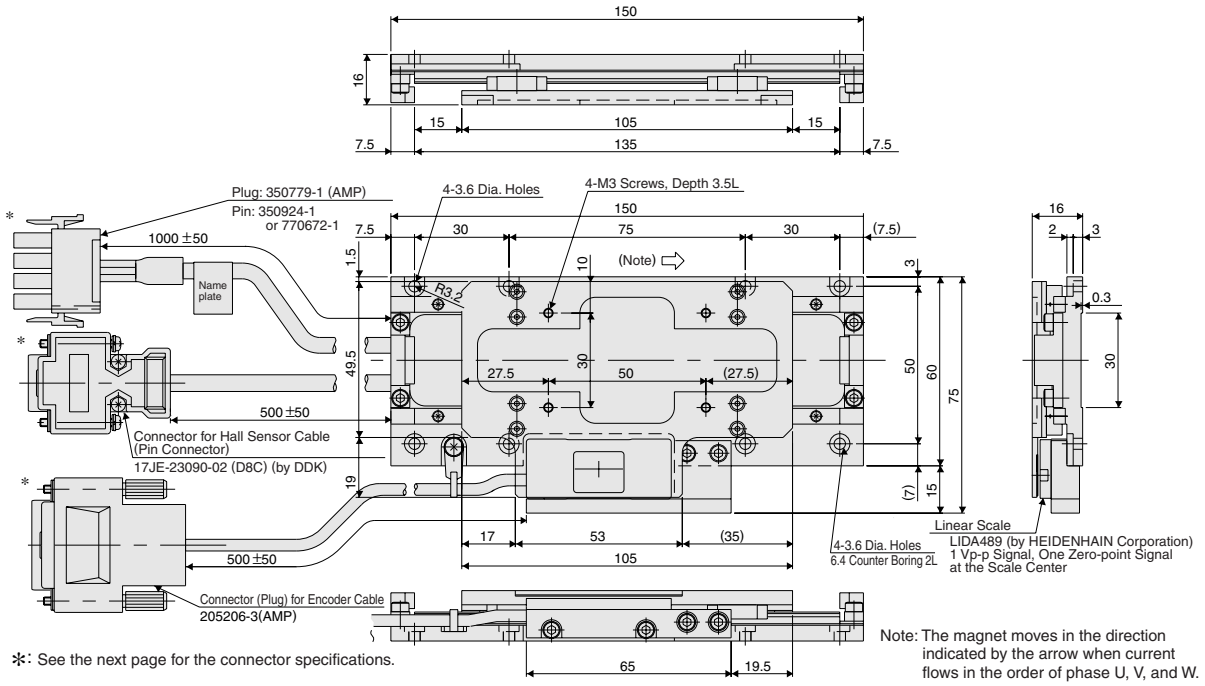


Note: The magnet moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

*: See the next page for the connector specifications.

Linear Slider Model SGTMM01-	L1	L2	L3	L4	L5	L6	L7	L8	L9	N
010AM20A	80	75	63	14	42	8	—	11	22.5	3
030AM20A	100	95	83	10.5	16	42	16	10.5	32.5	4

(2) SGTMM03-025AH20AP

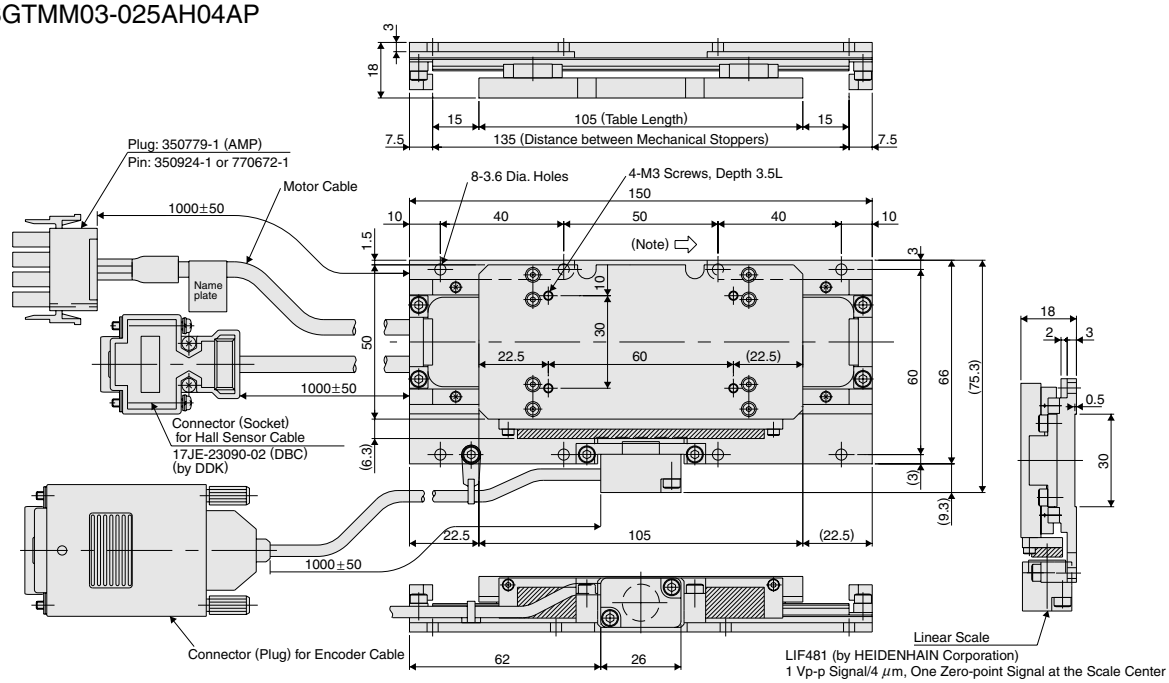


Note: The magnet moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

*: See the next page for the connector specifications.

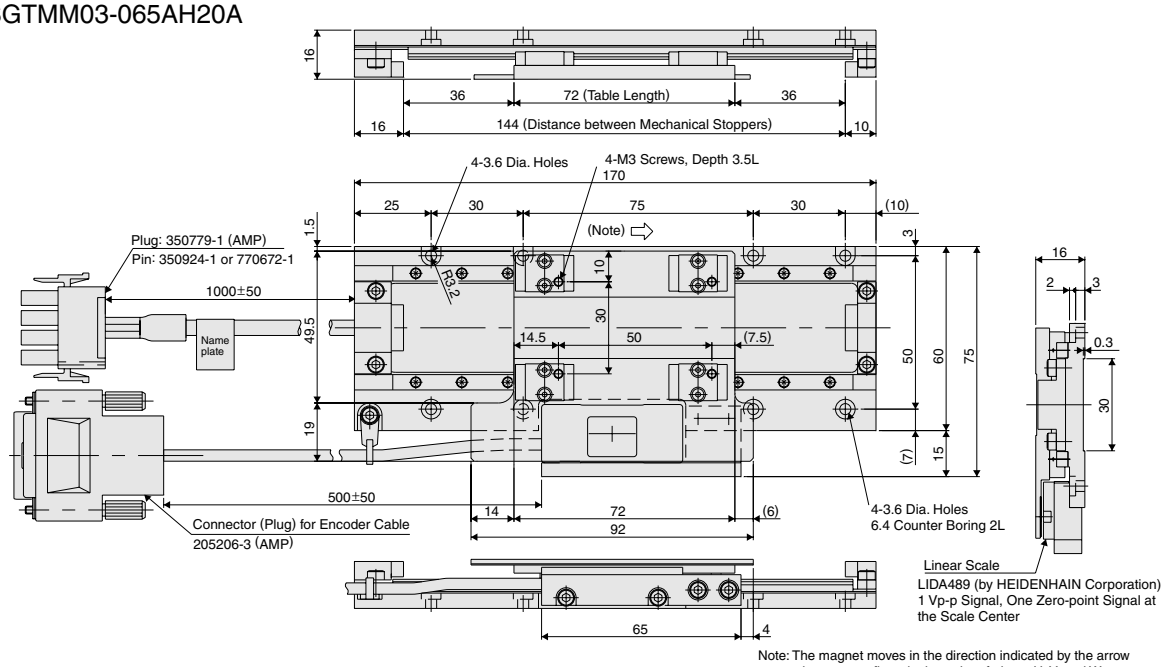
• External Dimensions

(3) SGTMM03-025AH04AP



Note: The magnet moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

(4) SGTMM03-065AH20A



Note: The magnet moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

• Connector Specifications for the Σ-Trac-μ Series of Linear Sliders (All Models)

For SGTMM01 Linear Sliders

For Motor Cable

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

For Encoder Cable

Pin No.	Signal	Pin No.	Signal
1	IW–	9	N/C
2	IW+	10	N/C
3	Test	11	N/C
4	Transmit	12	+5 V
5	Receive	13	GND
6	Reset	14	Cos–
7	Cos+	15	Sin–
8	Sin+		

For SGTMM03 Linear Sliders

For Motor Cable

Pin No.	Name	Lead Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

For Encoder Cable

Pin No.	Signal	Pin No.	Signal
1	Cos output (A+)	9	/Cos output (A–)
2	0 V	10	0 V sensor
3	Sin output (B+)	11	/Sin output (B–)
4	+5 V	12	5 V sensor
5	Not used	13	Not used
6	Not used	14	/Ref (R+)
7	/Ref (R–)	15	Not used
8	Not used	Case	Shield

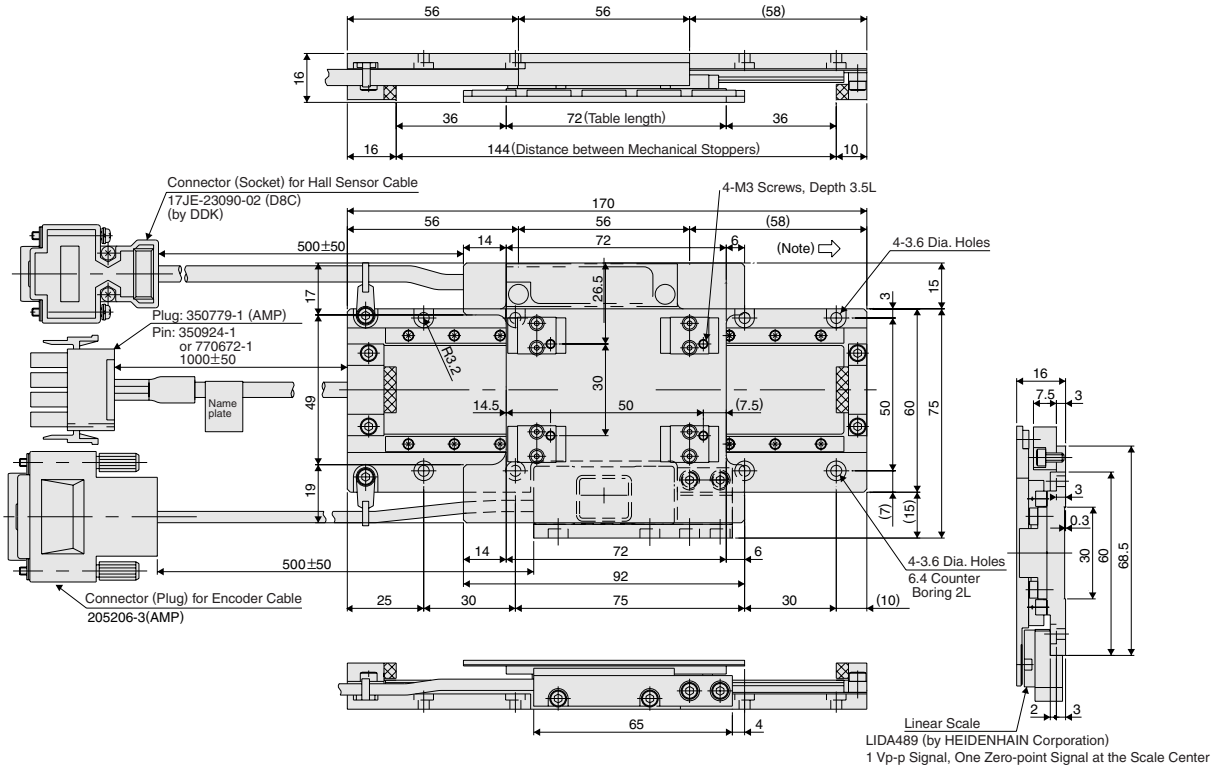
For Hall Sensor Cable

Pin No.	Signal
1	+5V (power supply)
2	Phase-U output
3	Phase-V output
4	Phase-W output
5	0V (power supply)
6	Not used
7	Not used
8	Not used
9	Not used

SGTMM Linear Sliders Units: mm

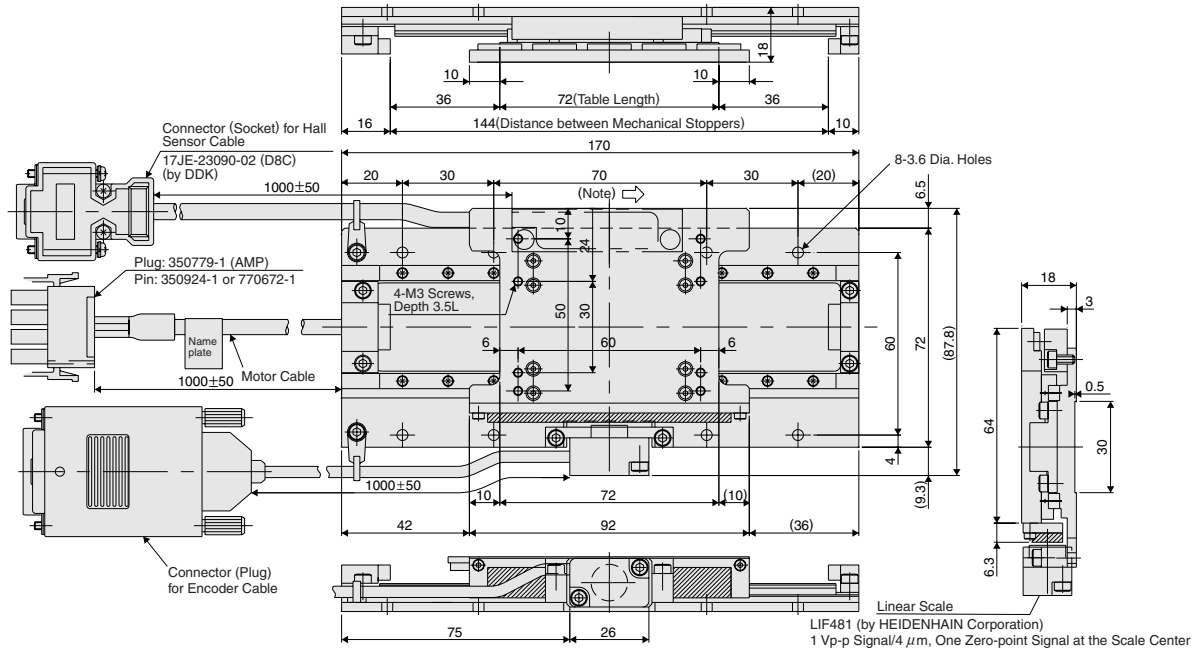
- External Dimensions

(5) SGTMM03-065AH20AP



Note: The magnet moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

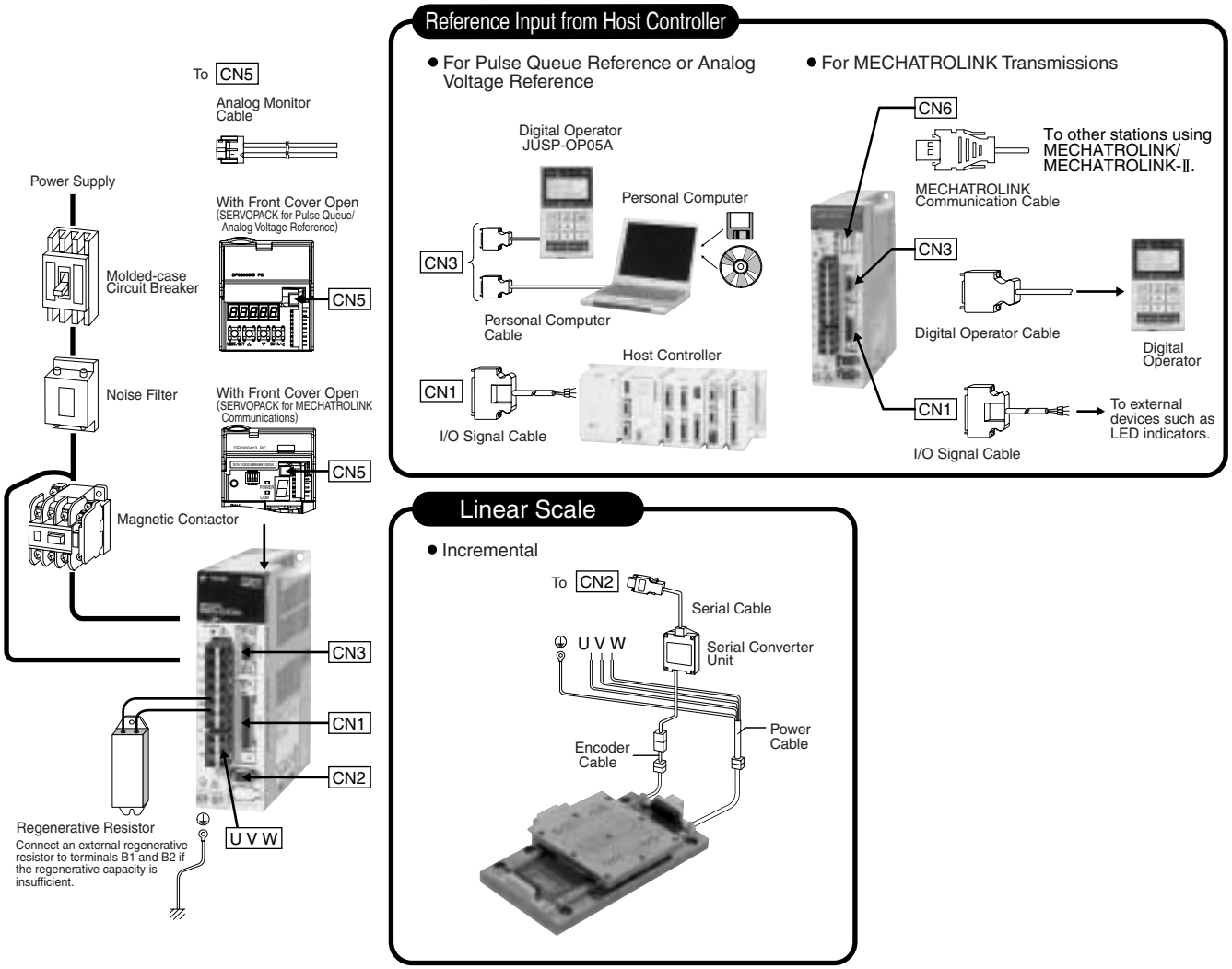
(6) SGTMM03-065AH04AP



Note: The magnet moves in the direction indicated by the arrow when current flows in the order of phase U, V, and W.

Selecting Cables and Connectors

● Peripheral Devices



● Applicable Cables and Connectors

Motor Type	Linear Scale Type	AC Servo Drive				Motor Cable	Linear-scale Connection Cables		
		Σ-Trac-μ Series Model	SERVOPACK Model SGDS-*1			SERVOPACK ↔ Motor	Serial Converter Unit Model JZDP-*2	[CN2] ↔ Serial Converter Unit	Serial Converter Unit ↔ External Encoder
			Single-phase 100 V	Single-phase 200 V	Three-phase 200 V	Power Cable (Flexible Type)		Serial Cable (Flexible Type)	Encoder Cable (Flexible Type)
Moving Magnet (MM)	Incremental	SGTMM01-010AM20A	A5F□5A	A5A□5A	—	JZSP-CLN11-□□-E	D003-242	JZSP-CLP70-□□-E □□ indicates the length of the cable. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m 20 = 20 m	JZSP-CLL00-□□-E □□ indicates the length of the cable. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m Note: For SGTMM01 linear sliders, a JZSP-CLL40-E cable (length: 0.2 m) is also required.
		SGTMM01-030AM20A	A5F□5A	A5A□5A	—	JZSP-CLN11-□□-E	D003-242		
		SGTMM03-025AH20AP	01F□5A	01A□5A	—	JZSP-CLN11-□□-E	D006-221		
		SGTMM03-025AH04AP	01F□5A	01A□5A	—	JZSP-CLN11-□□-E	D006-221		
		SGTMM03-065AH20A	01F□5A	01A□5A	—	JZSP-CLN11-□□-E	D003-220		
		SGTMM03-065AH20AP	01F□5A	01A□5A	—	JZSP-CLN11-□□-E	D006-220		
		SGTMM03-065AH04AP	01F□5A	01A□5A	—	JZSP-CLN11-□□-E	D006-220		

*1:The code shown in the squares (□) varies in accordance with the reference.
*2:If you are ordering RoHS compliant products, add "-E" on the end of the model name.

Selecting Cables and Connectors

● Applicable Peripheral Devices

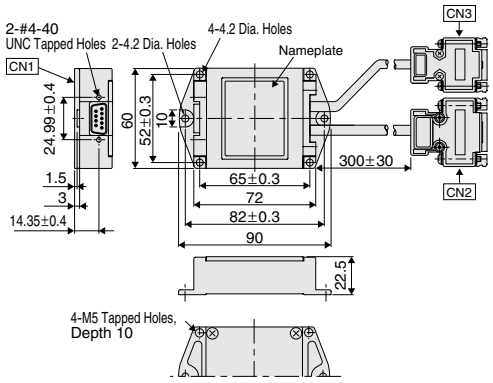
Main Circuit Power Supply	SERVOPACK Capacity W	SERVOPACK Model SGDS-	Digital Operator Model	Molded-case Circuit Breaker Power Supply Capacity per SERVOPACK	Molded-case Circuit Breaker MCCB/Fuse Capacity (Note 1)	Noise Filter (Recommended)	Magnetic Contactor	Surge Absorber	AC/DC Reactor
Single-phase 100 V	50	A5F	JUSP-OP05A (with a 1 m cable)	0.25 kVA	4 Arms	FN2070-6/07 (Single-phase 250 VAC, 6A)	SC-03	R·C·M -601BQZ-4	X5053
	100	01F		0.40 kVA					
Single-phase 200 V	50	A5A		0.25 kVA					X5052
	100	01A		0.40 kVA					

Notes: 1 Nominal value at the rated load. The specified derating is required to select an appropriate fuse capacity. Cut-off characteristics (at 25 ℃) is 200 % for two seconds min. and 700% for 0.01 seconds min.
- Do not use a fast-acting fuse. Because the SERVOPACK's power supply is a capacitor input type, a fast-acting fuse may blow when the power is turned on.
- The SGDS SERVOPACK does not include a protective circuit for grounding. To protect the system, install a ground-fault detector against overloads and short circuits or install a protective ground-fault detector combined with the molded-case circuit breaker for grounding.

2 The following peripheral devices are manufactured by:
- Noise filter: Schaffner EMC, Inc.
- Magnetic contactor: Fuji Electric FA Components & Systems Co., Ltd.
- Surge absorber: Okaya Electric Industries Co., Ltd. (Surge Protector)
- AC/DC reactor: Yaskawa Controls Co., Ltd.

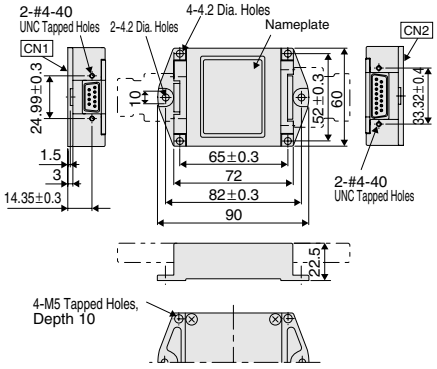
● Detail Drawings: Serial Converter Units for Linear Scales by HEIDENHAIN Corporation

● With Cable for Hall Sensor
JZDP-D006-□□□
JZDP-D006-□□□-E(RoHS compliant)



Note: For details on connectors, refer to page 360.

● With Cable for Hall Sensor
JZDP-D003-□□□
JZDP-D003-□□□-E(RoHS compliant)

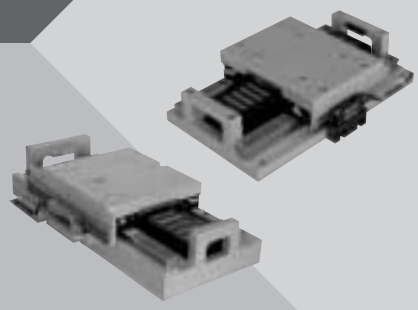


Note: For details on connectors, refer to page 338.

	Pulse Queue or Analog Voltage Reference			MECHATROLINK Communications			Cables for Setting Devices/Monitors	
Serial Converter Unit↔Hall Sensor	I/O Signal Connector [CN1]			I/O Signal Connector [CN1]		MECHATROLINK Communication Connector [CN6A] or [CN6B]	[CN3]↔Setting Devices	[CN5]
Hall Sensor Cable (Flexible Type)	Connector Terminal Block Converter Unit	Cable with Loose Wires at One End	Connector Kit [CN1]	Connector Terminal Block Converter Cable	Connector Kit [CN1]		Personal Computer Cable	Analog Monitor Cable
JZSP-CLL10-□□-E □□ indicates the length of the cable. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m	JUSP-TA50PG-E (with a 0.5 m cable)	JZSP-CSI01-□-E □ indicates the length of the cable. 1 = 1 m 2 = 2 m 3 = 3 m	JZSP-CSI9-1-E	JZSP-TA26P-□-E	JZSP-CSI9-2-E (DE9411354)	MECHATROLINK communications cable JEPMC-W6002-□□-E □□ indicates the length of the cable. A5 = 0.5 m 20 = 20 m 01 = 1 m 30 = 30 m 03 = 3 m 40 = 40 m 05 = 5 m 50 = 50 m 10 = 10 m MECHATROLINK terminator JEPMC-W6022-E	JZDP-CMS02-E (2 m)	JZSP-CA01-E (1 m)

Linear Sliders

Σ-Trac-MAG



Model Designation

● With Incremental Linear Scales

SGT M F4 A - 027 A H 20 A

- SGT: Σ-Trac series linear slider
- M: Moving magnet type
- F4 / F5: Armature Code (Armature not integrally mounted)
  - F4 : SGLFW-35A230A-F
  - F5 : SGLFW-50A380A-F
- A / B: Table Length
  - A : Short
  - B : Long
- 027 / 036 / 054 / 072: Peak Force
  - 027 : 270 N
  - 036 : 360 N
  - 054 : 540 N
  - 072 : 720 N
- A: Linear Scale Output Form
  - A: Analog output 1 Vp-p
- H: Linear Scale Manufacturer
  - H: HEIDENHAIN Corporation
- 20: Linear Scale Resolution
  - 20 : 20μm
- A: Design Revision Order
  - A, B, C, ...

Armature Code	Table Length	Effective Stroke	Armature Code	Table Length	Effective Stroke
F4	A	100 mm	F5	A	185 mm
	B	65 mm		B	110 mm

● With Absolute (ABS) Linear Scales

SGT M F4 A - 027 ABS 1 A

- SGT: Σ-Trac series linear slider
- M: Moving magnet type
- F4 / F5: Armature Code (Armature not integrally mounted)
  - F4 : SGLFW-35A230A-F
  - F5 : SGLFW-50A380A-F
- A / B: Table Length
  - A : Short
  - B : Long
- 027 / 036 / 054 / 072: Peak Force
  - 027 : 270 N
  - 036 : 360 N
  - 054 : 540 N
  - 072 : 720 N
- ABS: With an absolute linear scale
- 1: Linear Scale Specifications
  - 1 : ST781A (by Mitutoyo Corporation, resolution: 0.5 μm)
  - 2 : ST783A (by Mitutoyo Corporation, resolution: 0.1 μm)
- A: Design Revision Order
  - A, B, C, ...

Armature Code	Table Length	Effective Stroke	Armature Code	Table Length	Effective Stroke
F4	A	100 mm	F5	A	185 mm
	B	65 mm		B	110 mm

Features

- Optimum drive for high-acceleration and high-tact operations because of its lightweight moving member.
- For short strokes (65 mm to 185 mm)
- Cooling units (pipes, etc.) for forced-air or liquid cooling systems can be placed on the fixed side.
- Linear scale options: Incremental or absolute.
- Improved stroke efficiency*

*:Ratio of effective stroke to the total length of drive system

Model Classification

● Force

SERVOPACK Model SGDS-		Σ-Trac-MAG Series Linear Sliders	
Single-phase 100 VAC	Single-phase 200 VAC	Model	Force 200 N 400 N 600 N 800 N 1000 N
02F□5A	02A□5A	SGTMF4A-027	
02F□5A	02A□5A	SGTMF4B-036	
–	08A□5A	SGTMF5A-054	
–	08A□5A	SGTMF5B-072	

Rated force / Peak force

● Stroke Length

Linear Slider Model	Stroke Length 50 mm 100 mm 150 mm 200 mm
SGTMF4A-027	● 100 mm
SGTMF4B-036	● 65 mm
SGTMF5A-054	● 185 mm
SGTMF5B-072	● 110 mm

SGTMF4 Linear Sliders

● Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0 ˚C to 40 ˚C
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Protection Methods: Self-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130 ˚C (Insulation class B)

Linear Slider Model		With Incremental Linear Scales		With Absolute Linear Scales	
		SGTMF4A-027AH20A	SGTMF4B-036AH20A	SGTMF4A-027ABS1A	SGTMF4B-036ABS1A
Applicable SERVOPACK Model	SGDS-	02A	02A	02A	02A
Applicable Serial Converter Unit Model	JZDP-	D003-243	D003-244	—	—
Rated Force	N	90	120	90	120
Peak Force	N	270	360	270	360
Force Constant	N/Arms	66.9	89.2	66.9	89.2
Motor Constant	$N/\sqrt{W}$	11	14.6	11	14.6
Maximum Payload*1	kg	40	55	40	55
Effective Stroke	mm	100	65	100	65
Resolution	μm	Incremental encoder: 0.078 (20 μm/256)		Absolute encoder*3: 0.5	
Movable Member Mass	kg	1.72	2.52	1.72	2.52
Total Mass (excluding cables)	kg	6.8	8.05	6.8	8.05
Repeatability*2	μm	±1.0	±1.0	±1.0	±1.0

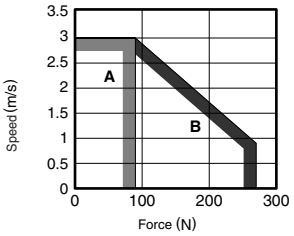
*1: Values obtained when the acceleration is 4.9 m/s².
*2: Values obtained when the surrounding air temperature is constant.
*3: An absolute encoder with a resolution of 0.1 μm is also available. Contact your Yaskawa representative for details.

● Performance Curves

(1) SGTMF4A-027

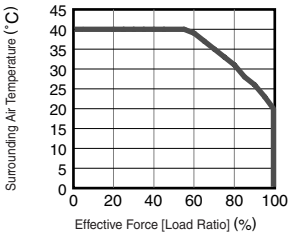
● Force - Speed

(A : Continuous Duty Zone B : Intermittent Duty Zone)

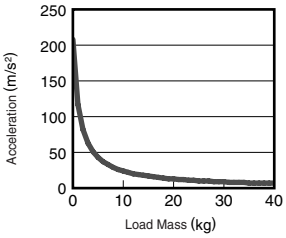


● Effective Force - Surrounding Air Temperature

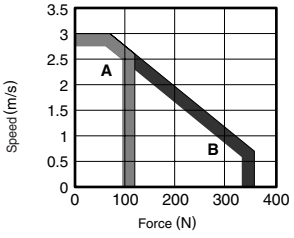
When the sensor temperature is 50 ˚C or less
Surrounding Air Temperature

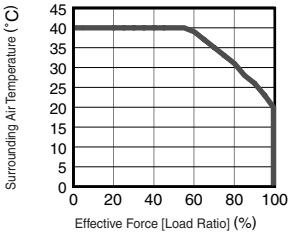


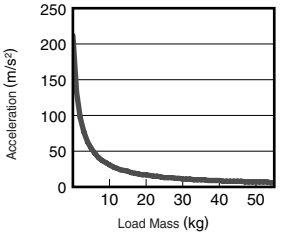
● Load Mass - Acceleration



(2) SGTMF4B-036



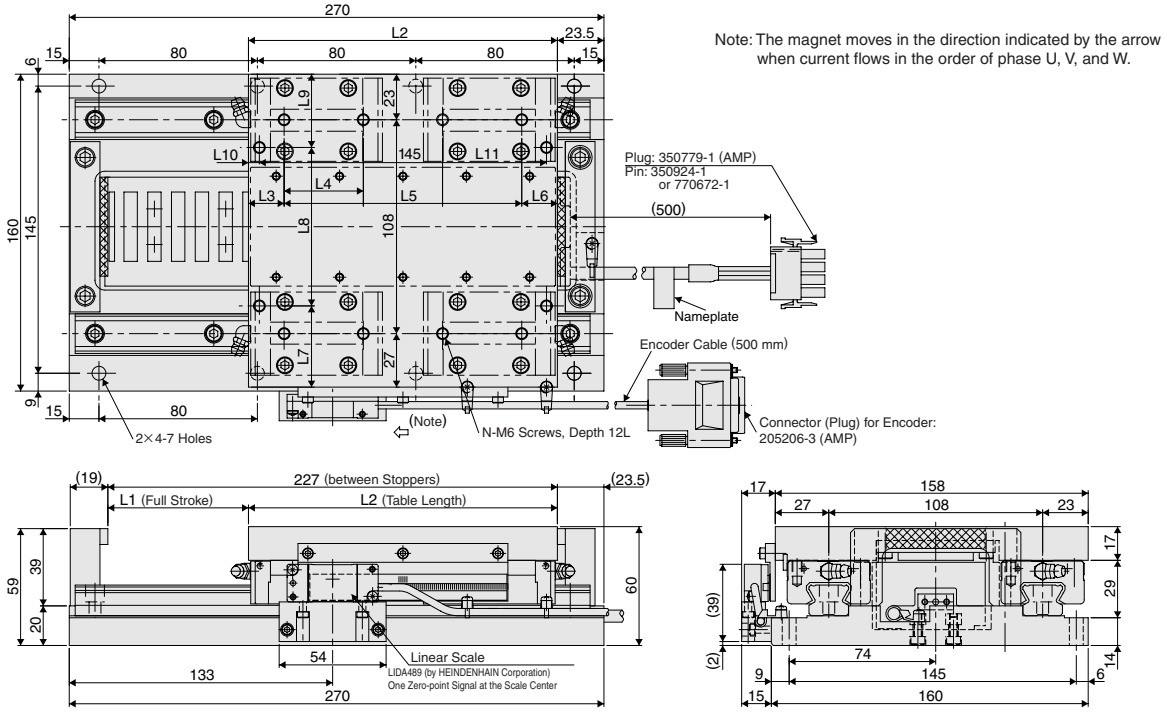




SGTMF4 Linear Sliders Units: mm

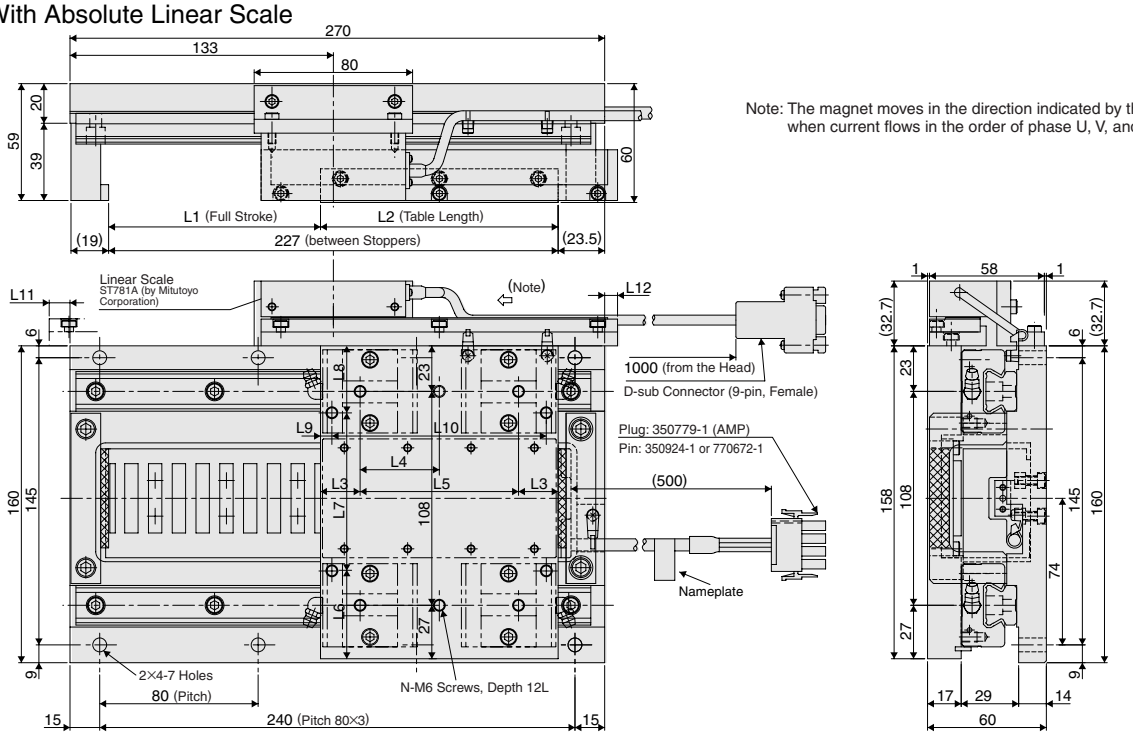
● External Dimensions

● With Incremental Linear Scale



Linear Slider Model SGTMF	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	N
4A-027AH20A	107	120	20	40	80	20	—	—	—	—	—	6
4B-036AH20A	71	156	18	40	120	18	41	80	37	5.5	145	12

● With Absolute Linear Scale



Linear Slider Model SGTMF	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	N
4A-027ABS1A	107	120	20	40	80	—	—	—	—	—	10.5	6.5	6
4B-036ABS1A	71	156	18	40	120	41	80	37	5.5	145	—	—	12

SGTMF5 Linear Sliders

● Ratings and Specifications

Time Rating: Continuous
Insulation Resistance: 500 VDC, 10 MΩ min.
Surrounding Air Temperature: 0 ˚C to 40 ˚C
Excitation: Permanent magnet

Dielectric Strength: 1500 VAC for one minute
Protection Methods: Self-cooled
Ambient Humidity: 20% to 80% (no condensation)
Allowable Winding Temperature: 130 ˚C (Insulation class B)

Linear Slider Model		With Incremental Linear Scales		With Absolute Linear Scales	
		SGTMF5A-054AH20A	SGTMF5B-072AH20A	SGTMF5A-054ABS1A	SGTMF5B-072ABS1A
Applicable SERVOPACK Model	SGDS-	08A	08A	08A	08A
Applicable Serial Converter Unit Model	JZDP-	D003-245	D003-246	—	—
Rated Force	N	150	200	150	200
Peak Force	N	540	720	540	720
Force Constant	N/Arms	59.4	79.1	59.4	79.1
Motor Constant	$N/\sqrt{W}$	18.5	24.7	18.5	24.7
Maximum Payload*1	kg	85	110	85	110
Effective Stroke	mm	185	110	185	110
Resolution	μm	Incremental encoder: 0.078 (20 μm/256)		Absolute encoder*3: 0.5	
Movable Member Mass	kg	4.2	6.84	4.2	6.84
Total Mass (excluding cables)	kg	19.8	22.5	19.8	22.5
Repeatability*2	μm	±1.0	±1.0	±1.0	±1.0

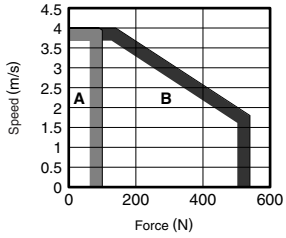
*1: Values obtained when the acceleration is 4.9 m/s².
*2: Values obtained when the surrounding air temperature is constant.
*3: An absolute encoder with a resolution of 0.1 μm is also available. Contact your Yaskawa representative for details.

● Performance Curves

(1) SGTMF5A-054

● Force - Speed

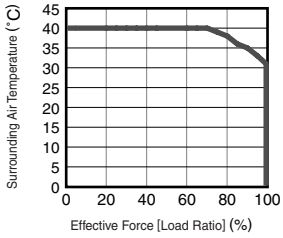
(A : Continuous Duty Zone B : Intermittent Duty Zone)



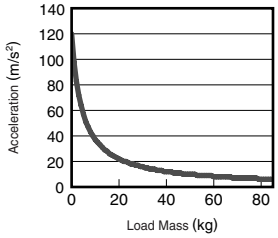
● Effective Force - Surrounding Air Temperature

When the sensor temperature is 50 ˚C or less

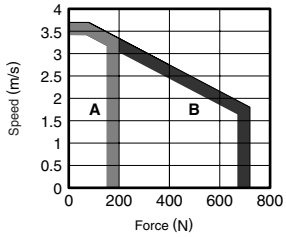
Surrounding air temperature

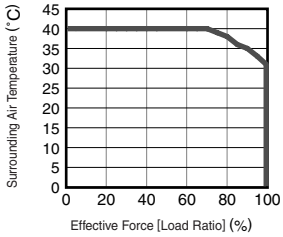


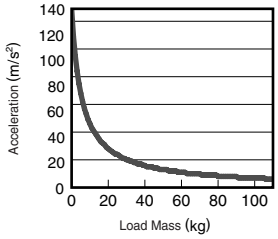
● Load Mass - Acceleration



(2) SGTMF5B-072



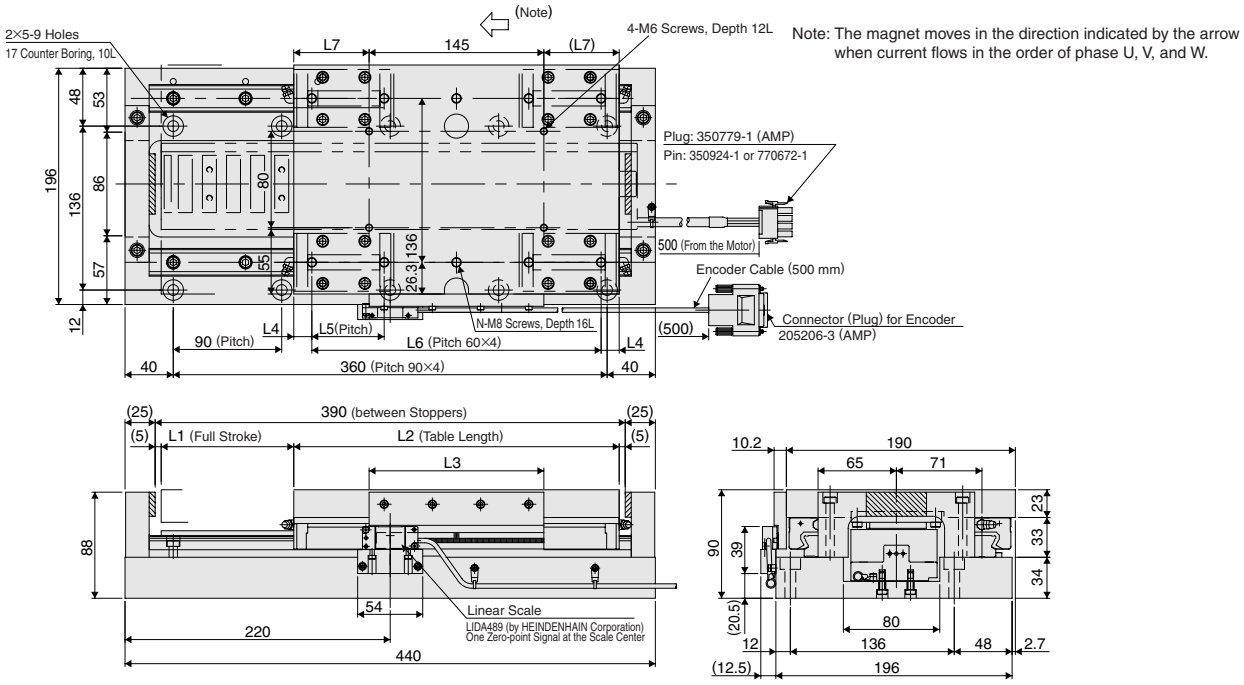




SGTMF5 Linear Sliders Units: mm

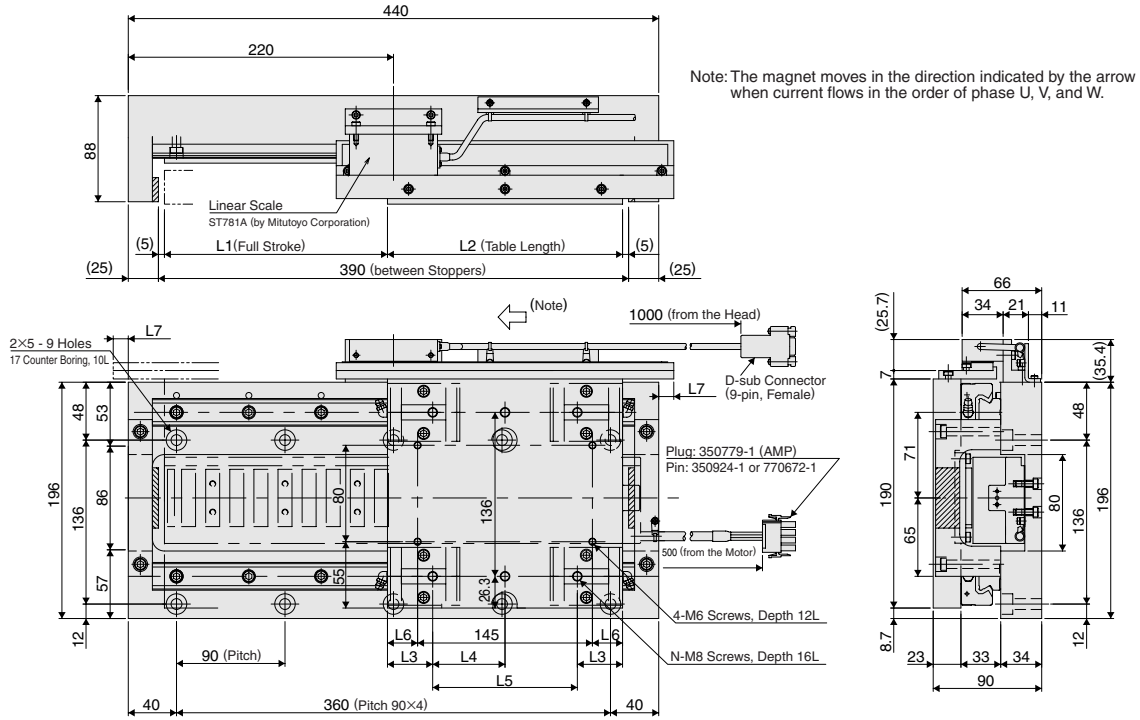
● External Dimensions

● With Incremental Linear Scale



Linear Slider Model SGTMF	L1	L2	L3	L4	L5	L6	L7	N
5A-054AH20A	185	195	220	37.5	60	120	25	6
5B-072AH20A	110	270	145	15	60	240	62.5	10

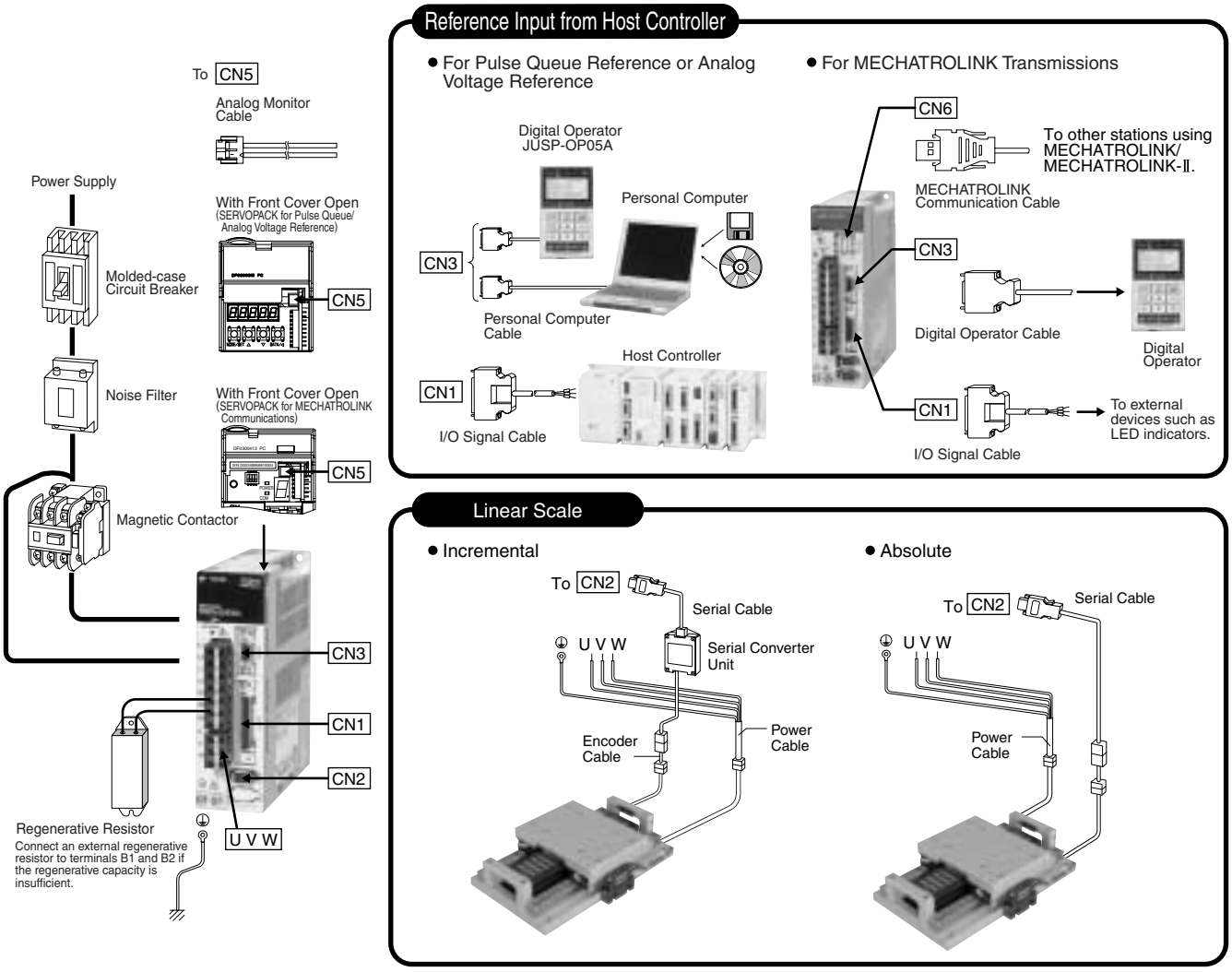
● With Absolute Linear Scale



Linear Slider Model SGTMF	L1	L2	L3	L4	L5	L6	L7	N
5A-054ABS1A	185	195	37.5	60	120	25	12.5	6
5B-072ABS1A	110	270	15	60	240	62.5	—	10

Selecting Cables and Connectors

● Peripheral Devices



● Applicable Cables and Connectors

Motor Type	Linear Scale Type	AC Servo Drive				Motor Cable	Linear-scale Connection Cables		
		Σ-Trac-MAG Series Model	SERVOPACK Model SGDS-*1			SERVOPACK ↔ Motor	Serial Converter Unit Model JZDP-*2	[CN2] ↔ Serial Converter Unit	Serial Converter Unit ↔ External Encoder
			Single-phase 100 V	Single-phase 200 V	Three-phase 200 V	Power Cable (Flexible Type)		Serial Cable (Flexible Type)	Encoder Cable (Flexible Type)
Moving Magnet (MM)	Incremental	SGTMF4A-027AH20A	02F□5A	02A□5A	—	JZSP-CLN11-□□-E	D003-243	JZSP-CLP70-□□-E	JZSP-CLL00-□□-E
		SGTMF4B-036AH20A	02F□5A	02A□5A	—	JZSP-CLN11-□□-E	D003-244	□□ indicates the length of the cable. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m 20 = 20 m	□□ indicates the length of the cable. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m
		SGTMF5A-054AH20A	—	08A□5A	—	JZSP-CLN21-□□-E	D003-245		
		SGTMF5B-072AH20A	—	08A□5A	—	JZSP-CLN21-□□-E	D003-246		
	Absolute	SGTMF4A-027ABS1A	02F□5A	02A□5A	—	JZSP-CLN11-□□-E	—	JZSP-CLP70-□□-E [CN2] ↔ External encoder	—
		SGTMF4B-036ABS1A	02F□5A	02A□5A	—	JZSP-CLN11-□□-E	—		
		SGTMF5A-054ABS1A	—	08A□5A	—	JZSP-CLN21-□□-E	—		
		SGTMF5B-072ABS1A	—	08A□5A	—	JZSP-CLN21-□□-E	—		

*1: The code shown in the squares (□) varies in accordance with the reference.
*2: If you are ordering RoHS compliant products, add "-E" on the end of the model name.

Selecting Cables and Connectors

● Applicable Peripheral Devices

Main Circuit Power Supply	SERVOPACK Capacity W	SERVOPACK Model SGDS-	Digital Operator Model	Molded-case Circuit Breaker: Power Supply Capacity per SERVOPACK	Molded-case Circuit Breaker: MCCB/Fuse Capacity (Note 1)	Noise Filter (Recommended)	Magnetic Contactor	Surge Absorber	AC/DC Reactor
Single-phase 100 V	200	02F	JUSP-OP05A (with a 1 m cable)	0.60 kVA	6 Arms	FN2070-10/07 (Single-phase 250 VAC, 10 A)	SC-03	R·C·M -601BQZ-4	X5054
Single-phase 200 V	200	02A		0.75 kVA	4 Arms	FN2070-6/07 (Single-phase 250 VAC, 6 A)			X5053

Notes: 1 Nominal value at the rated load. The specified derating is required to select an appropriate fuse capacity. Cut-off characteristics (at 25 ℃) is 200 % for two seconds min. and 700% for 0.01 seconds min.
- Do not use a fast-acting fuse. Because the SERVOPACK's power supply is a capacitor input type, a fast-acting fuse may blow when the power is turned on.
- The SGDS SERVOPACK does not include a protective circuit for grounding. To protect the system, install a ground-fault detector against overloads and short circuits or install a protective ground-fault detector combined with the molded-case circuit breaker for grounding.

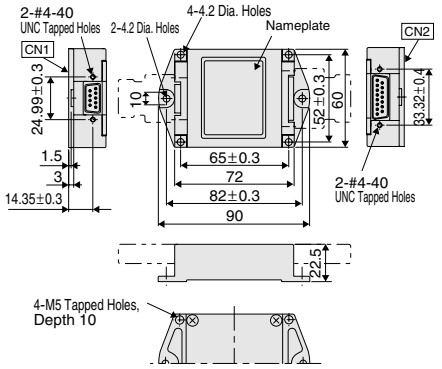
2 The following peripheral devices are manufactured by:
- Noise filter: Schaffner EMC, Inc.
- Magnetic contactor: Fuji Electric FA Components & Systems Co., Ltd.
- Surge absorber: Okaya Electric Industries Co., Ltd. (Surge Protector)
- AC/DC reactor: Yaskawa Controls Co., Ltd.

● Detail Drawings: Serial Converter Units for Linear Scales by HEIDENHAIN Corporation

● without Cable for Hall Sensor

JZDP-D003-□□□

JZDP-D003-□□□-E (RoHS compliant)



Note: For details on connectors, refer to page 338.

	Pulse Queue or Analog Voltage Reference			MECHATROLINK Communications			Cables for Setting Devices/Monitors	
	I/O Signal Connector [CN1]			I/O Signal Connector [CN1]		MECHATROLINK Communication Connector [CN6A] or [CN6B]	[CN3]↔Setting Devices	[CN5]
	Connector Terminal Block Converter Unit	Cable with Loose Wires at One End	Connector Kit [CN1]	Connector Terminal Block Converter Unit	Connector Kit [CN1]		Personal Computer Cable	Analog Monitor Cable
	JUSP-TA50PG-E (with a 0.5 m cable)	JZSP-CSI01-□-E □ indicates the length of the cable. 1 = 1 m 2 = 2 m 3 = 3 m	JZSP-CSI9-1-E	JZSP-TA26P-□-E	JZSP-CSI9-2-E (DE9411354)	MECHATROLINK communications cable JEPMC-W6002-□□-E □□ indicates the length of the cable. A5 = 0.5 m 20 = 20 m 01 = 1 m 30 = 30 m 03 = 3 m 40 = 40 m 05 = 5 m 50 = 50 m 10 = 10 m MECHATROLINK terminator JEPMC-W6022-E	JZDP-CMS02-E (2 m)	JZSP-CA01-E (1 m)

SERVOPACKs

For Linear Servomotors

SGDS-□□□05

(Analog Voltage Reference or Pulse-train Reference)

The SGDS SERVOPACK in combination with a linear servomotor demonstrates high-precision positioning in a wide speed range from high to low.

Features

● Outstanding linearity

The SERVOPACK d-q axis control ensures outstanding linearity even at peak force.

● Top performance

Uses the finest cutting-edge technology, such as the 600-Hz response, less-deviation control, and vibration suppression control.
The technology of the Σ-Ⅲ series SERVOPACKs in combination with the high rigidity of the linear servomotor reduces the positioning settling time.

● Reduced speed ripple

The fully-closed control system of the external encoder realizes extremely smooth positioning.

Model Designation

SGDS - A5 A 05 A □

Σ-Ⅲ Series
SGDS SERVOPACK

Max. Rated Output of Applicable Servomotor

Code	Specifications
A5	50 W
01	100 W
02	200 W
04	400 W
05	500 W
08	750 W
10	1.0 kW
15	1.5 kW
20	2.0 kW
30	3.0 kW
50	5.0 kW
75	7.5 kW

Supply Voltage

Code	Specifications
A	200 VAC
F	100 VAC (100-V input, 200-V output: Doubled voltage)

Interface
05 : For analog voltage/pulse-train reference (For linear servomotors)

Design Revision Order
A, B,...

Mounting Method
Blank : Base-mounted
R : Rack-mounted

Ratings and Specifications

SERVOPACK Model SGDS-				A5	01	02	04	05	08	10	15	20	30	50	75
Basic Specifications	Max. Applicable Servomotor Capacity kW			0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	7.5
	100 V	Continuous Output Current Arms		0.66	0.91	2.1	2.8	—							
		Max. Output Current Arms		2.1	2.8	6.5	8.5	—							
	200 V	Continuous Output Current Arms		0.66	0.91	2.1	2.8	3.8	5.5	7.6	11.6	18.5	18.9	32.9	54.7
		Max. Output Current Arms		2.1	2.8	6.5	8.5	11.0	16.9	17.0	28.0	42.0	56.0	84.0	130.0
	Input Power Supply	SERVOPACK Capacity Range for 100/200 V		Single-phase 100 VAC							—				
				Single-phase 200 VAC				—	Single-phase 200 VAC	—					
				—				Three-phase 200 VAC	—	Three-phase 200 VAC					
		200 V	Main Circuit	Three-phase (or 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											
		100 V	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											
	Control Method			Single or three-phase full-wave rectification IGBT-PWM (sine-wave driven)											
	Feedback			1/256 data of serial converter unit sine wave pitch (incremental)											
	Operating Conditions	Surrounding Air/Storage Temperature		0℃ to +55℃/−20℃ to +85℃											
		Ambient/Storage Humidity		90% RH or less (with no condensation)											
		Vibration/Shock Resistance		4.9 m/s²/19.6 m/s²											
	Configuration			Base-mounted (Rack mounting available as an option for SGDS-A5 to -50)											
	Performance	Speed Control Range		1:5000 (The lowest speed of the speed control range is the speed at which the servomotor will not stop with a rated force load.)											
		Speed Regulation*	Load Regulation	0 to 100% load: ±0.01% max. (at rated speed)											
			Voltage Regulation	Rated voltage ±10% : 0% (at rated speed)											
			Temperature Regulation	25 ±25℃: ±0.1% max. (at rated speed)											
		Frequency Characteristics		600 Hz (at $J_L = J_M$)											
		Force Control Tolerance (Repeatability)		±1%											
		Soft Start Time Setting		0 to 10 s (Can be set individually for acceleraton and deceleration.)											
Built-in Functions	Dynamic Brake (DB)			Operated at main power OFF, servo alarm, servo OFF or overtravel											
	Regenerative Processing			External regenerative resistor				Built-in						External regenerative resistor	
	Overtravel Prevention (OT)			Dynamic brake stop at P-OT or N-OT, deceleration to a stop, or free run to a stop											
	Electronic Gear			0.001≦B/A≦1000											
	Protection			Overcurrent, overvoltage, low voltage, overload, regeneration error, main circuit sensor error, heat sink overheat, power phase loss, position error pulse overflow, overspeed, encoder error, overrun detection, CPU error, parameter error, and so on.											
	LED Display			CHARGE, five 7-segment LEDs (built-in Digital Operator functions)											
	Others			Reverse connection, zero position search, automatic motor discrimination function											

*: 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 variations or amplifier drift and changes in processing resistance due to temperature variation.
The ratio of speed changes to the rated speed represents speed regulation due to voltage and temperature variations.

Ratings and Specifications

Applicable SERVOPACK Model					SGDS-A5A05A to -75A05A All Capacities
Force/Speed/Position Control	Force Control	Input Signals	Reference Voltage		±3 VDC (Variable setting range: ±1 to ±10 VDC) at rated force, input voltage: ±12 V (max.) (forward movement with positive reference)
			Input Impedance		About 14 kΩ min.
			Circuit Time Constant		30 μs
	Speed Control	Performance	Soft Start Time Setting		0 to 10 s (Can be set individually for acceleration and deceleration.)
		Input Signals	Reference Voltage		±6 VDC (Variable setting range: ±2 to ±10 VDC) at rated force, input voltage: ±12 V (max.) (forward movement with positive reference)
			Input Impedance		About 14 kΩ min.
			Circuit Time Constant		30 μs
		Setting Speed Reference	Movement Direction Selection		With P control signal
			Speed Selection		With forward/reverse torque limit signal (speed 1 to 3 selection), servomotor stops or another control method is used when both are OFF.
	Position Control	Performance	Bias Setting		0 to 450 mm/s (setting resolution: 1 mm/s)
			Feed-forward Compensation		0 to 100% (setting resolution: 1%)
			Positioning Completed Width Setting		0 to 1073741824 reference units (setting resolution: 1 reference unit)
		Input Signals	Reference Pulse	Type	Sign+pulse train, CW+CCW pulse train, or 90° phase difference 2-phase pulse (phase A+phase B)
				Form	Non-insulated line driver (+5 V level)
				Frequency	1 Mpps max. (non-insulated line driver)
			Control Signal		Clear Signal
I/O Signals		Position Output	Form		Phase-A, -B, -C line driver
			Frequency Dividing Ratio		Any Setting Ratio
		Sequence Input	Signal allocation can be modified.		Servo ON, P control (or Control Mode switching, forward/reverse motor rotation by internal speed setting, zero clamping, reference pulse inhibit), forward run prohibited (P-OT), reverse run prohibited (N-OT), alarm reset, forward external force limit, reverse external force limit (or internal set speed control), gain changeover, and polarity detection
		Sequence Output	Fixed Output		Servo alarm, 3-bit alarm codes
			Signal allocation can be modified.		Select any three of the following signals: positioning completion (speed coincidence), rotation movement detection, servo ready, torgue limit, warning, positioning near, or brake signal.
Others		Analong Monitor (CN5)			Output voltage: ±8 VDC Analog monitor connector built in for monitoring speed, force, and other reference signals. Speed: 1 V/1000 mm/s Force: 1 V/rated force Position error pulse: 0.05 V/reference unit
		Communications	Interface		Digital Operator (hand type)
			Function		Status display, parameter setting, monitor display, alarm traceback display, JOG operation

● 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	Maximum Applicable Servomotor Capacity kW	SERVOPACK Model SGDS-	Power Supply Capacity kVA	Output Current (Effective Value) A	Main Circuit Power Loss W	Regenerative Resistor Power Loss*1 W	Control Circuit Power Loss W	Total Power Loss W
Single-phase 100 V	0.05	A5F	0.25	0.66	5.2	*2	13	18.2
	0.10	01F	0.40	0.91	12			25
	0.20	02F	0.60	2.1	16.4			29.4
	0.40	04F	1.2	2.8	24			37
Single-phase 200 V	0.05	A5A	0.25	0.66	4.6			17.6
	0.10	01A	0.40	0.91	6.7			19.7
	0.20	02A	0.75	2.1	13.3			26.3
	0.40	04A	1.2	2.8	20			33
	0.75	08A	2.2	5.5	47	12	15	74
Three-phase 200 V	0.5	05A	1.4	3.8	27	8		54
	1.0	10A	2.3	7.6	55	12		82
	1.5	15A	3.2	11.6	92	14		121
	2.0	20A	4.3	18.5	120	28		163
	3.0	30A	5.9	24.8	155	28		198
	5.0	50A	7.5	32.8	255	36	19	310
	7.5	75A	15.5	54.7	455	*3		474

*1: Regenerative resistor power losses are allowable losses. Take the following action if this value is exceeded.
- Remove the lead from the internal regenerative resistor in the SERVOPACK.
- Install an external regenerative resistor.

An external regenerative resistor is available as an option.

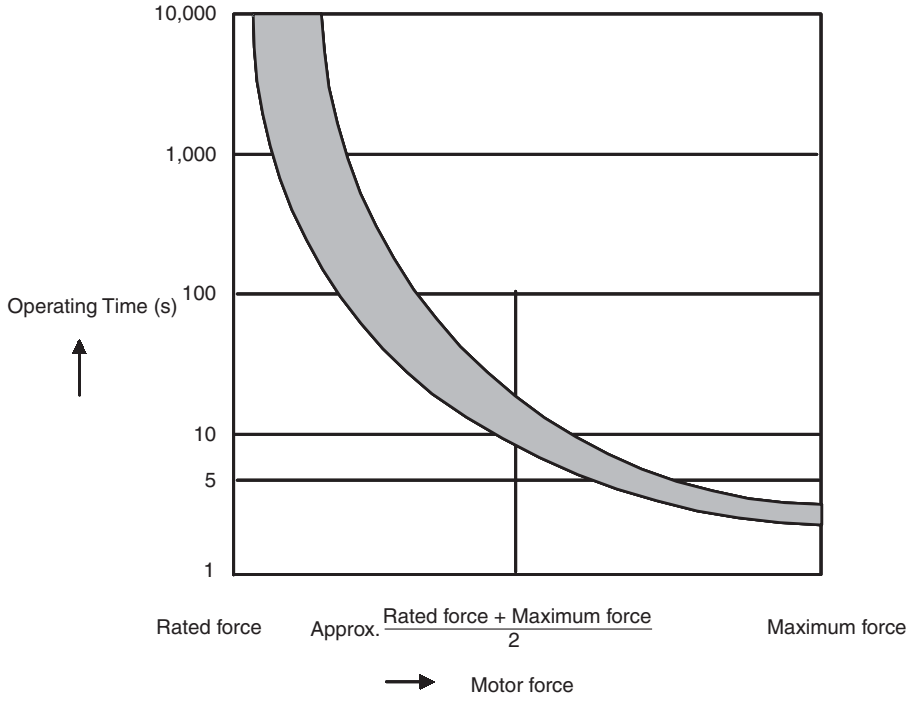
*2: SERVOPACKs with a capacity of 50 to 400 W do not have built-in regenerative resistors. If the regenerative energy exceeds the specified value, connect an external regenerative resistor.

*3: Install an external regenerative resistor when using the SERVOPACK with capacity of 6.0 kw or more.
The following regenerative resistor can be used:
- JUSP-RA05:For SGDS-75A(Allowable power loss 350 W)

Ratings and Specifications

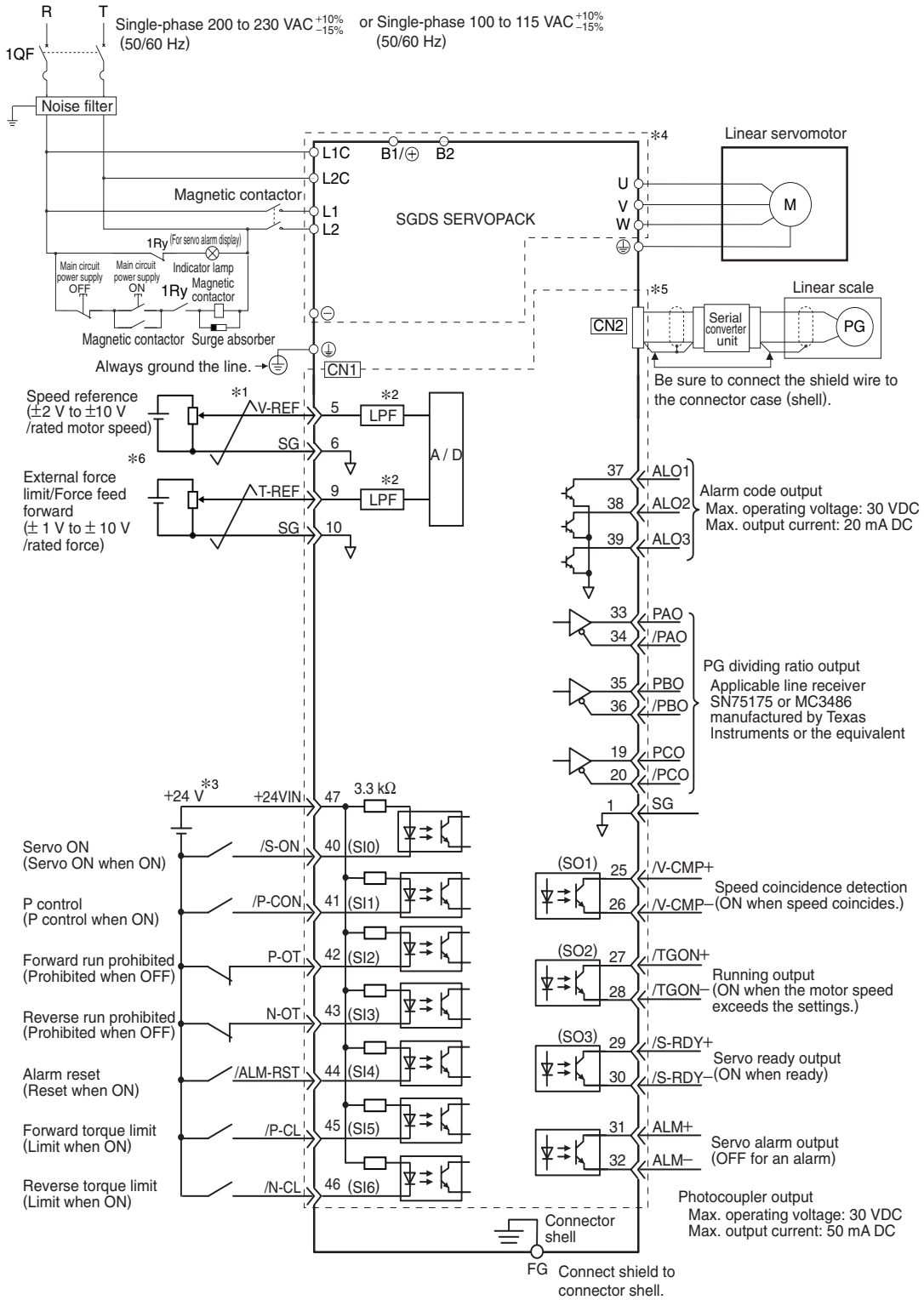
- Overload Characteristics

The overload detection level is set under hot start conditions at a servomotor surrouning air temperature of 40℃.



Connection Examples

● Single-phase 100 VAC or 200 VAC Power Supply Speed Control



∗1: ⩫ represents twisted-pair wires.

∗2: The time constant for the primary filter is 30 μs.

∗3: A 24-VDC power supply with double-shielded enclosure is provided by the customers.

∗4: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

∗5: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

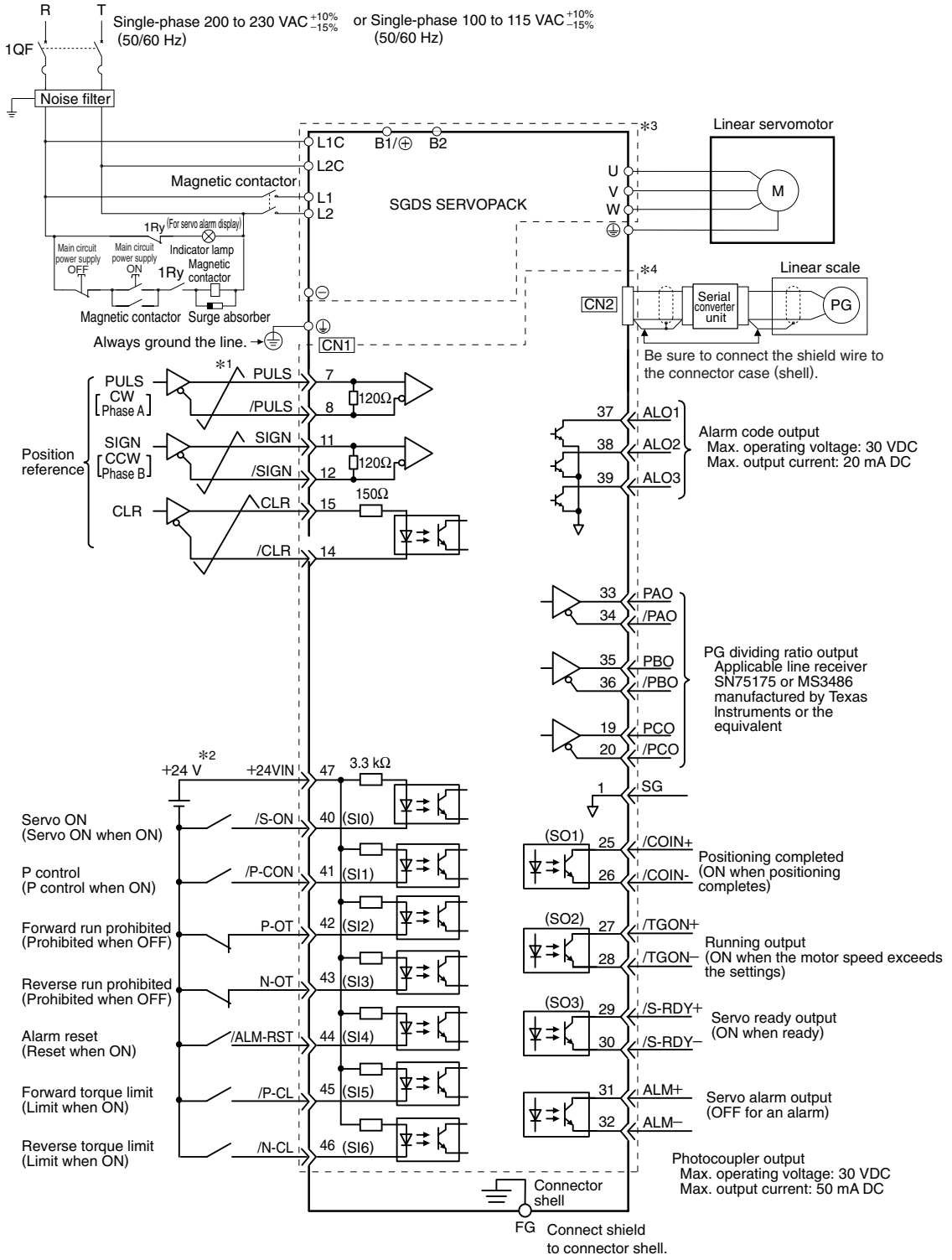
∗6: Enabled by the parameter setting.

Note: The functions allocated to the input signals SI0 to SI6 and the output signals SO1 to SO3 can be changed by using the parameters.

Connection Examples

- Single-phase 100 VAC or 200 VAC Power Supply

Position Control



*1: ⫽ represents twisted-pair wires.

*2: A 24-VDC power supply with double-shielded enclosure is provided by the customers.

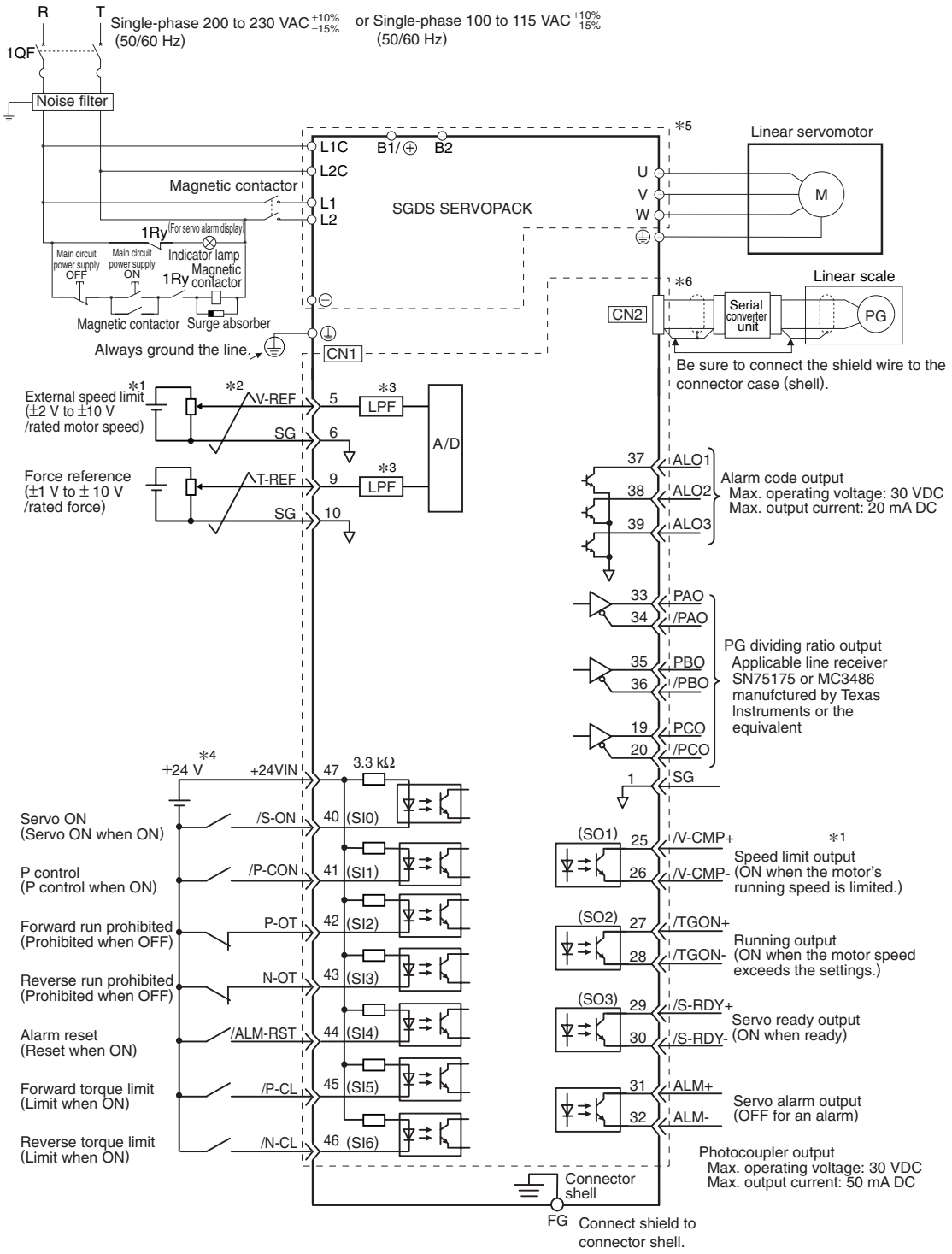
*3: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

*4: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

Note: The functions allocated to the input signals SI0 to SI6 and the output signals SO1 to SO3 can be changed by using the parameters.

Connection Examples

● Single-phase 100 VAC or 200 VAC Power Supply Force Control



∗1: Enabled by the parameter setting.

∗2: ⩫ represents twisted-pair wires.

∗3: The time constant for the primary filter is 30 μs.

∗4: A 24-VDC power supply with double-shielded enclosure is provided by the customers.

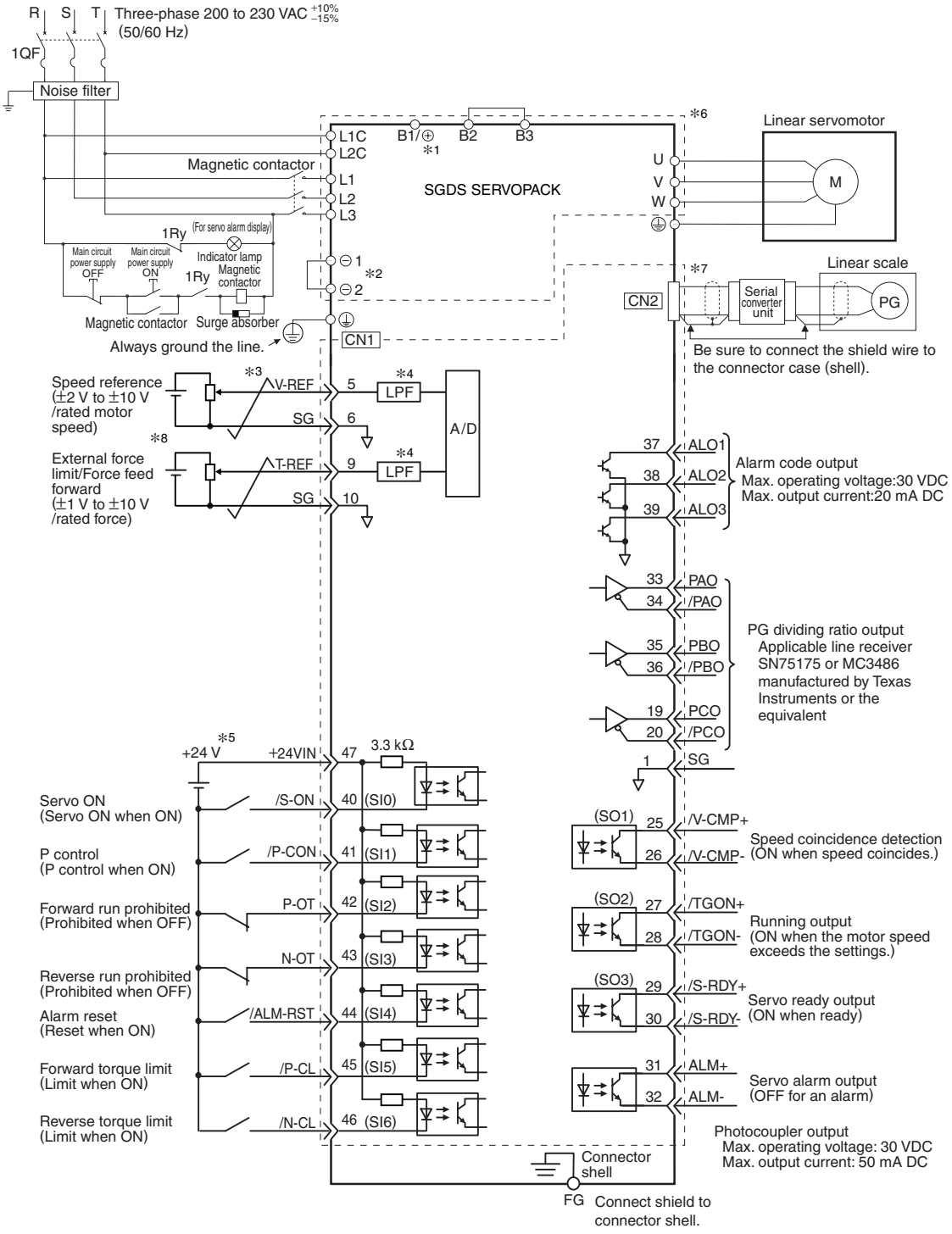
∗5: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

∗6: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

Note: The functions allocated to the input signals SI0 to SI6 and the output signals SO1 to SO3 can be changed by using the parameters.

Connection Examples

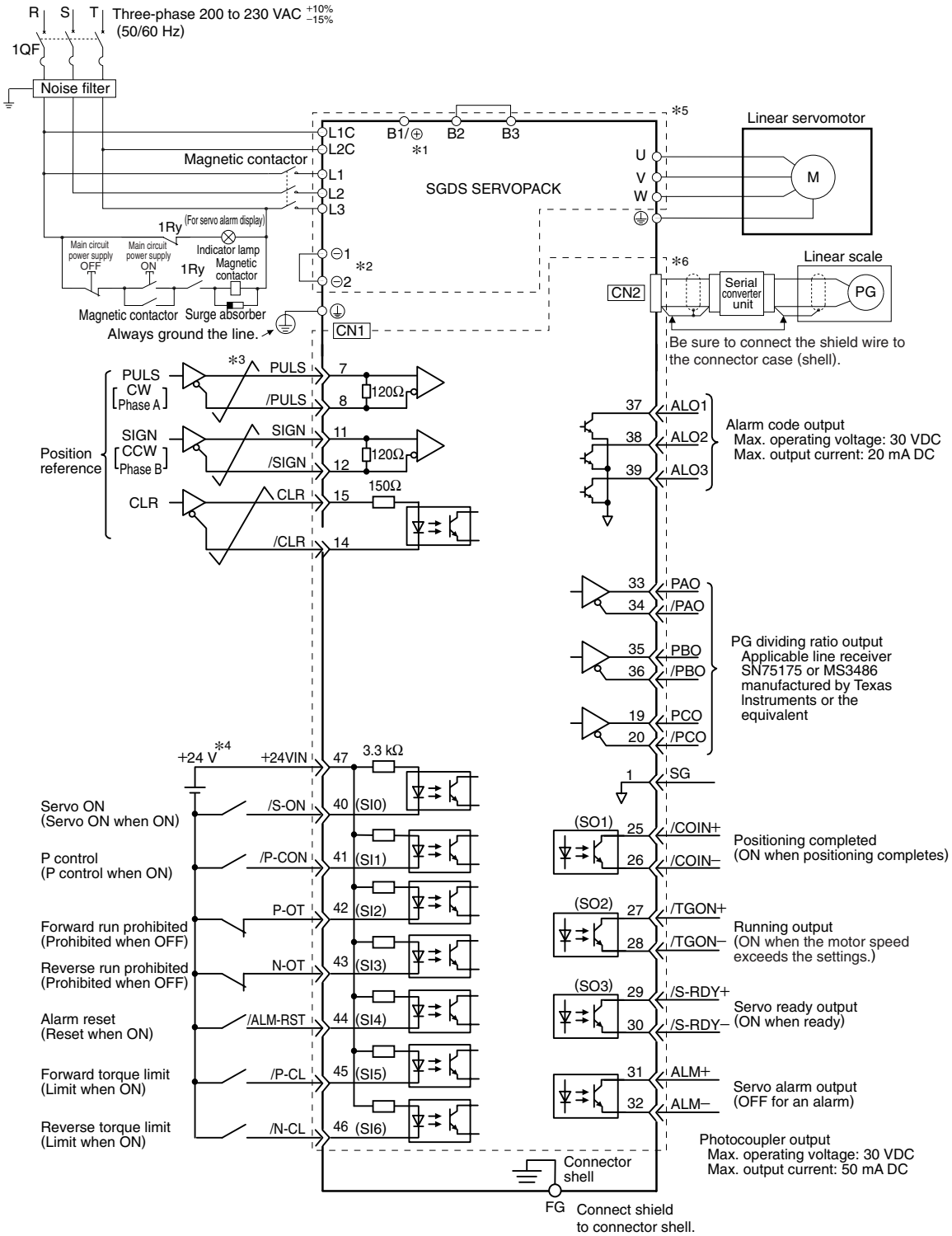
- Three-phase 200 VAC Power Supply
  Speed Control



∗1: If an external regenerative resistor is required, disconnect the wiring between the SERVOPACK's B2 and B3 terminals and connect an external regenerative resistor between the B1/⊕ and B2 terminals.
∗2: Connect a DC reactor for harmonic suppression between the SERVOPACK's ⊖1 and ⊖2 terminals.
∗3: ⩘ represents twisted-pair wires.
∗4: The time constant for the primary filter is 47 μs.
∗5: A 24-VDC power supply with double-shielded enclosure is provided by the customers.
∗6: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.
∗7: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.
Note: The functions allocated to the input signals SI0 to SI6 and the output signals SO1 to SO3 can be changed by using the parameters.

Connection Examples

● Three-phase 200 VAC Power Supply
Position Control



*1: If an external regenerative resistor is required, disconnect the wiring between the SERVOPACK's B2 and B3 terminals and connect an external regenerative resistor between the B1/⊕ and B2 terminals.

*2: Connect a DC reactor for harmonic suppression between the SERVOPACK's ⊖1 and ⊖2 terminals.

*3: ⩫ represents twisted-pair wires.

*4: A 24-VDC power supply with double-shielded enclosure is provided by the customers.

*5: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

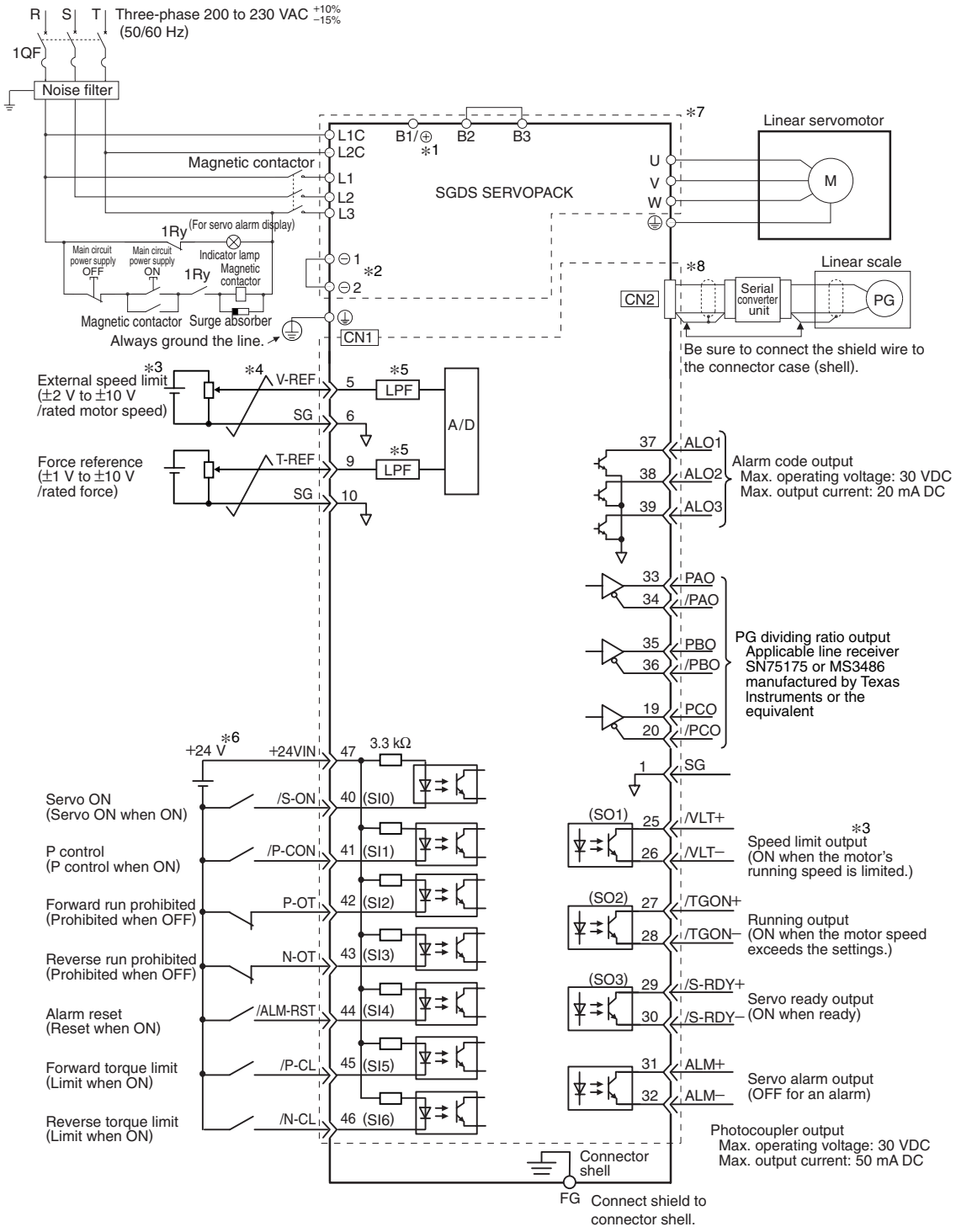
*6: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

Note: The functions allocated to the input signals SI0 to SI6 and the output signals SO1 to SO3 can be changed by using the parameters.

Connection Examples

- Three-phase 200 VAC Power Supply

Force Control



∗1: If an external regenerative resistor is required, disconnect the wiring between the SERVOPACK's B2 and B3 terminals and connect an external regenerative resistor between the B1/⊕ and B2 terminals.

∗2: Connect a DC reactor for harmonic suppression between the SERVOPACK's ⊖1 and ⊖2 terminals.

∗3: Enabled by the parameter setting.

∗4: ⩫ represents twisted-pair wires.

∗5: The time constant for the primary filter is 47 μs.

∗6: A 24-VDC power supply with double-shielded enclosure is provided by the customers.

∗7: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

∗8: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

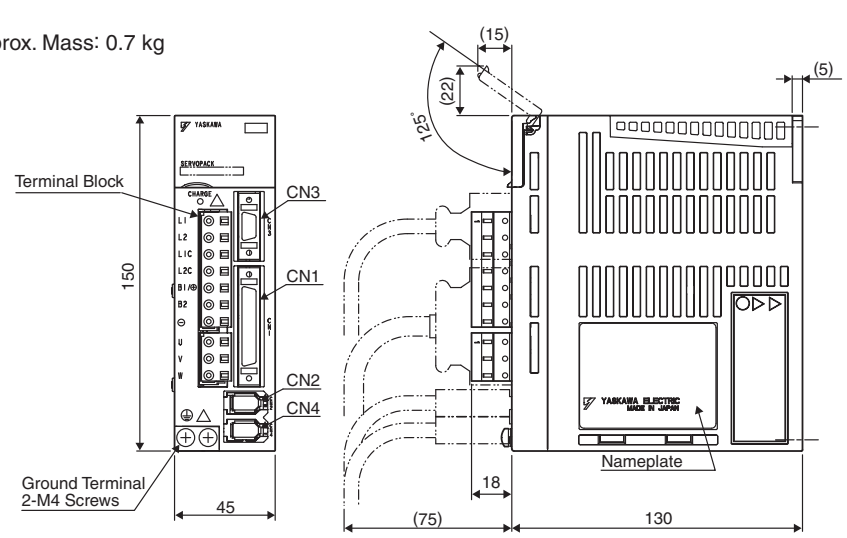
Note: The functions allocated to the input signals SI0 to SI6 and the output signals SO1 to SO3 can be changed by using the parameters.

External Dimensions Units: mm

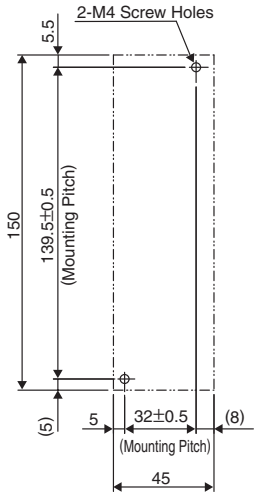
● Base-mounted SERVOPACKs

(1) Single-phase 100 V/200 V: 50 W to 200 W

Approx. Mass: 0.7 kg

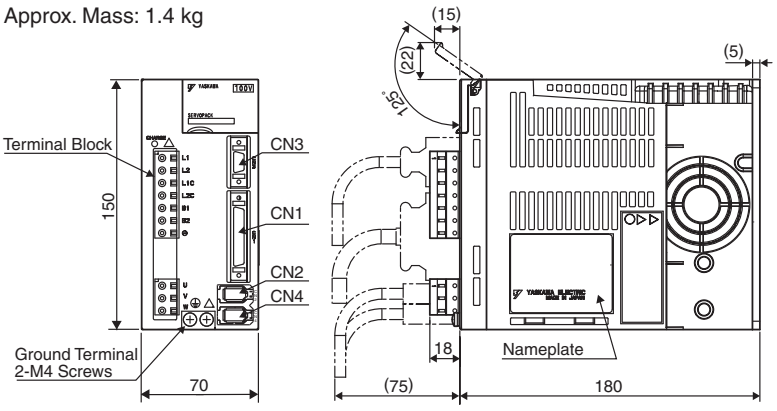


Mounting Hole Diagram

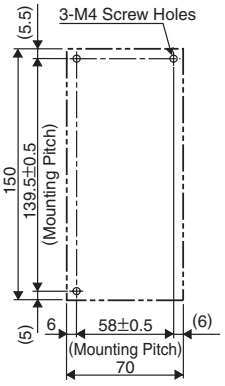


(2) Single-phase 100 V: 400 W

Approx. Mass: 1.4 kg

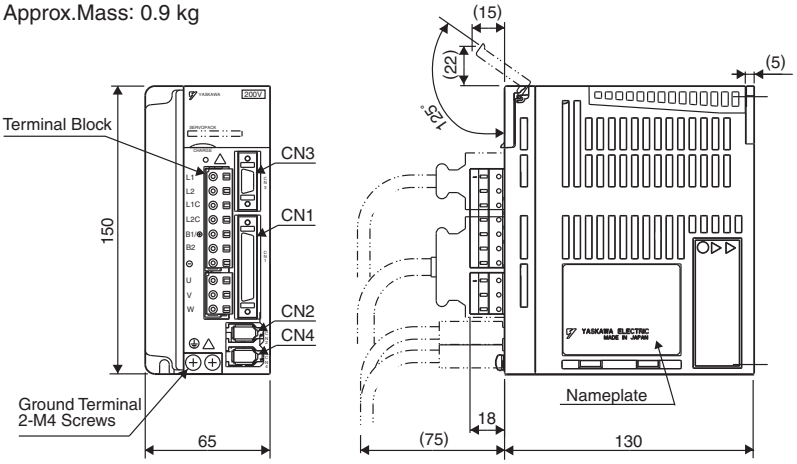


Mounting Hole Diagram

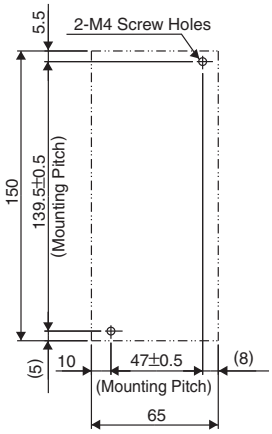


(3) Single-phase 200 V: 400 W

Approx.Mass: 0.9 kg



Mounting Hole Diagram

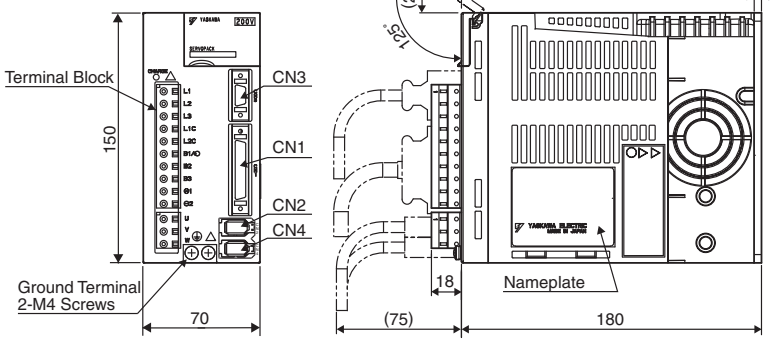


External Dimensions Units: mm

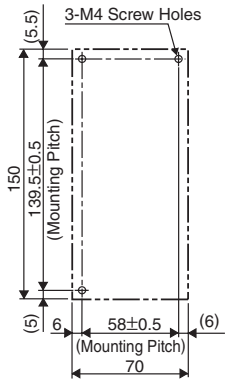
(4) Single-phase 200 V: 750 W
Three-phase 200 V: 500 W/1.0 kW

Note: Do not use the L3 terminal of the single-phase 200 V, 750 W SERVOPACK.

Approx. Mass: 1.4 kg

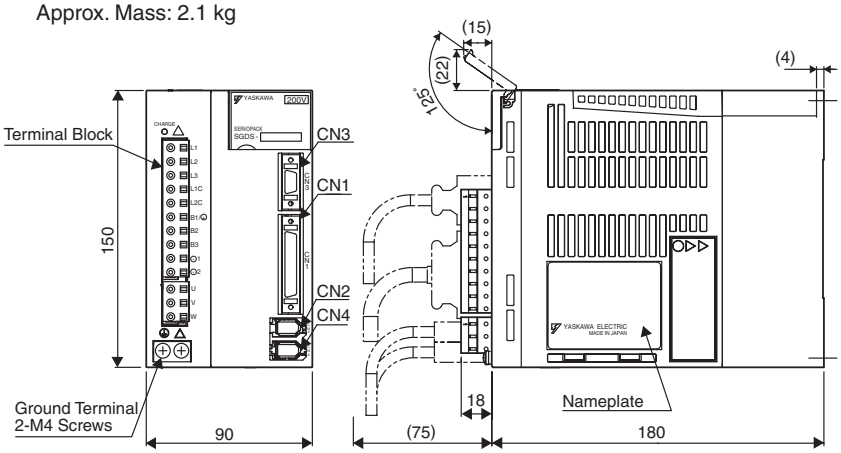


Mounting Hole Diagram

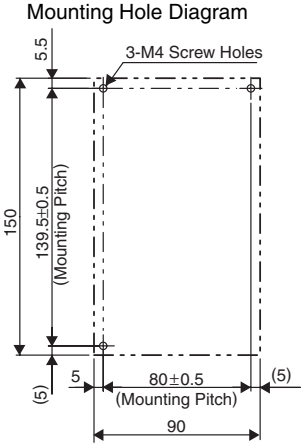


(5) Three-phase 200 V: 1.5 kW

Approx. Mass: 2.1 kg

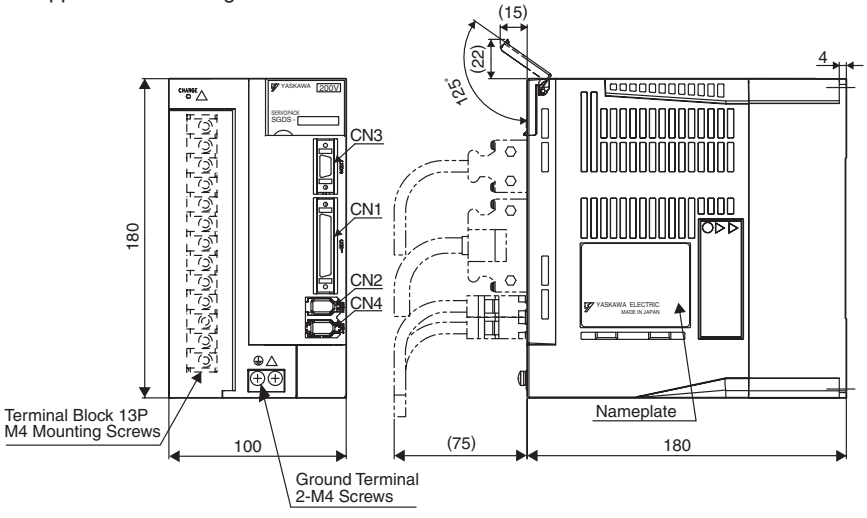


Mounting Hole Diagram

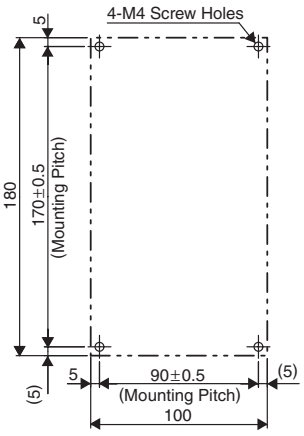


(6) Three-phase 200 V: 2.0 kW/3.0 kW

Approx. Mass: 2.8 kg



Mounting Hole Diagram



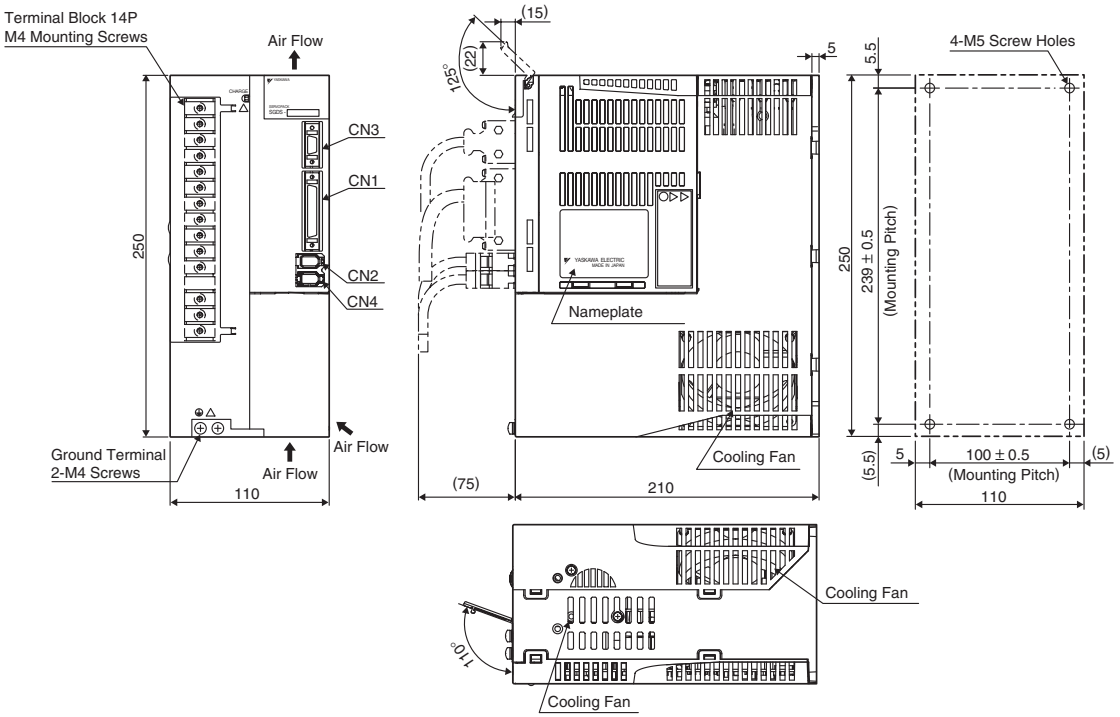
External Dimensions Units: mm

● Base-mounted SERVOPACKs

(7) Three-phase 200 V: 5.0 kW

Approx. Mass: 5.0 kg

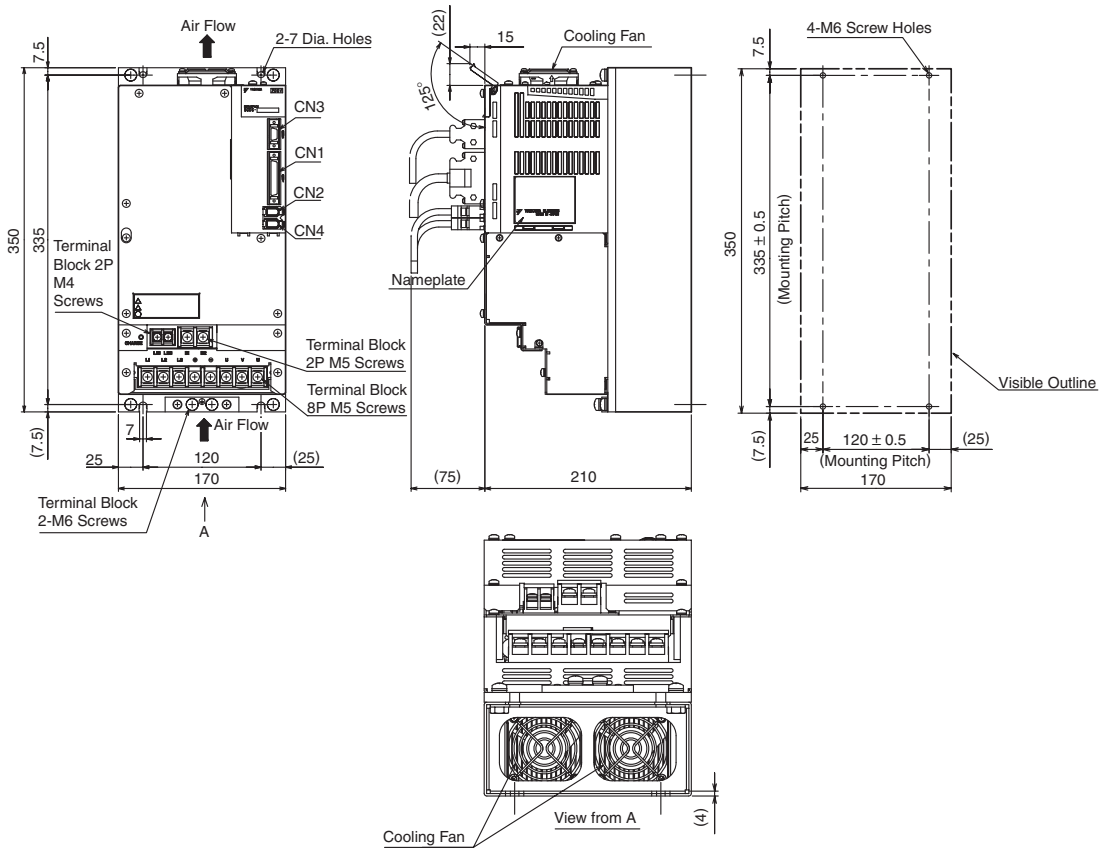
Mounting Hole Diagram



(8) Three-phase 200 V: 7.5 kW

Approx. Mass: 10.5 kg

Mounting Hole Diagram



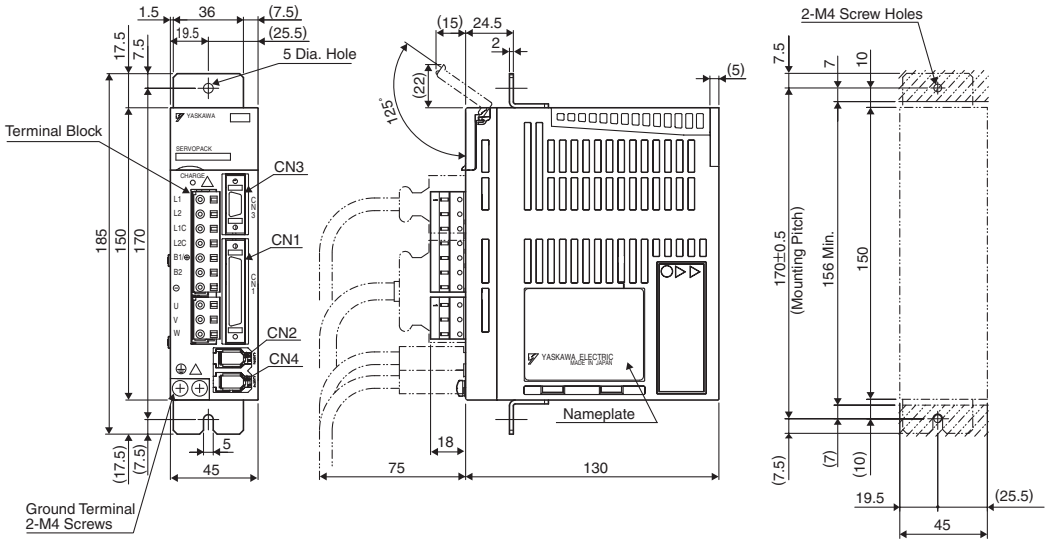
External Dimensions Units: mm

- Rack-mounted SERVOPACKs

(1) Single-phase 100 V /200 V: 50 W to 200 W

Approx. Mass: 0.7 kg

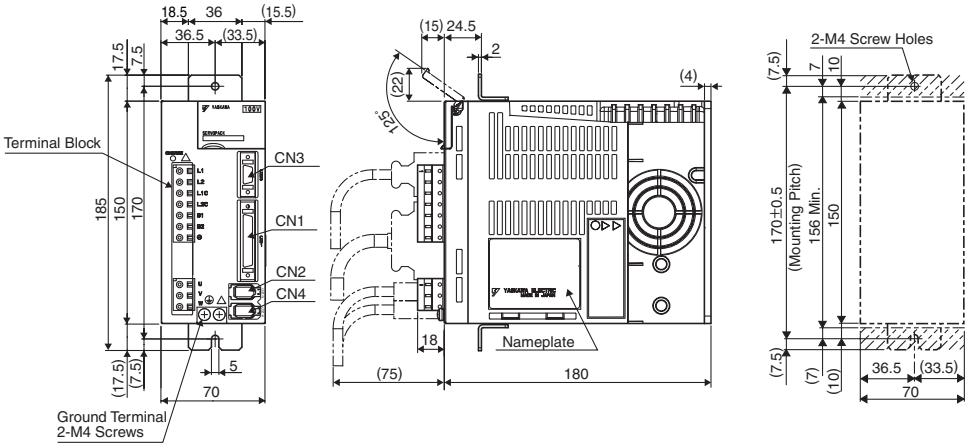
Mounting Hole Diagram



(2) Single-phase 100 V: 400 W

Approx. Mass: 1.4 kg

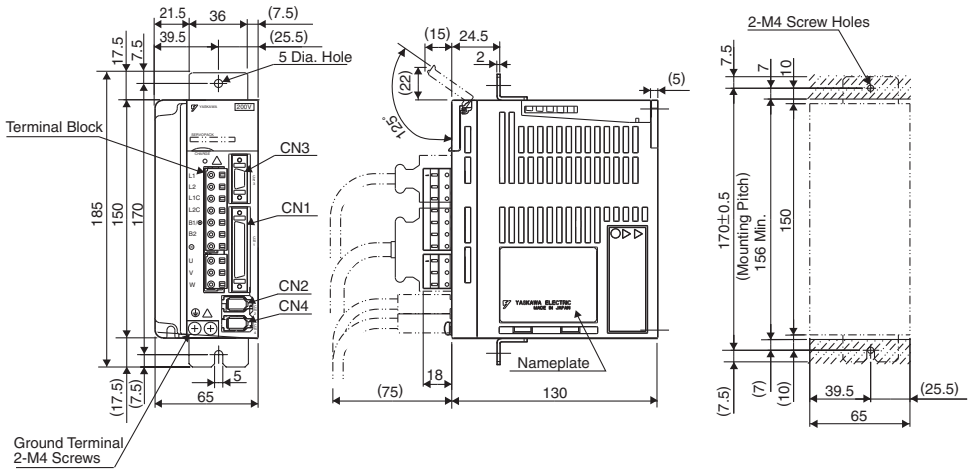
Mounting Hole Diagram



(3) Single-phase 200 V: 400 kW

Approx. Mass: 0.9 kg

Mounting Hole Diagram



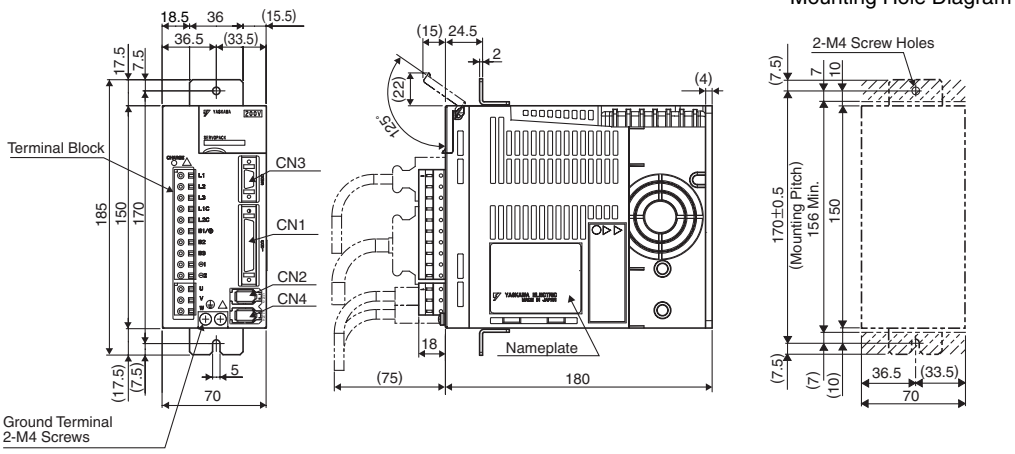
External Dimensions Units: mm

● Rack-mounted SERVOPACKs

(4) Single-phase 200 V: 750 W
Three-phase 200 V: 500 W/1.0 kW

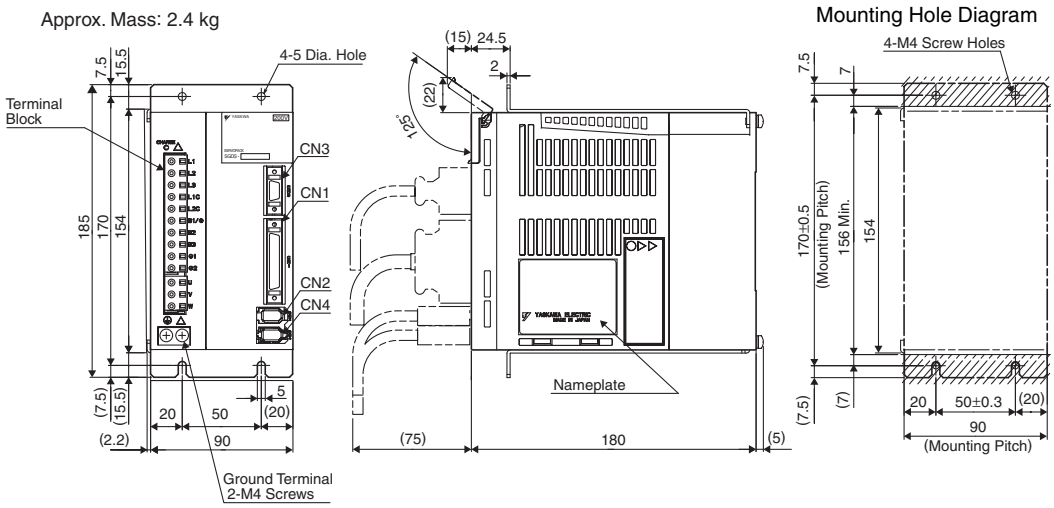
Note: Do not use the L3 terminal of the single-phase 200 V, 750 W SERVOPACK.

Approx. Mass: 1.4 kg



(5) Three-phase 200 V: 1.5 kW

Approx. Mass: 2.4 kg

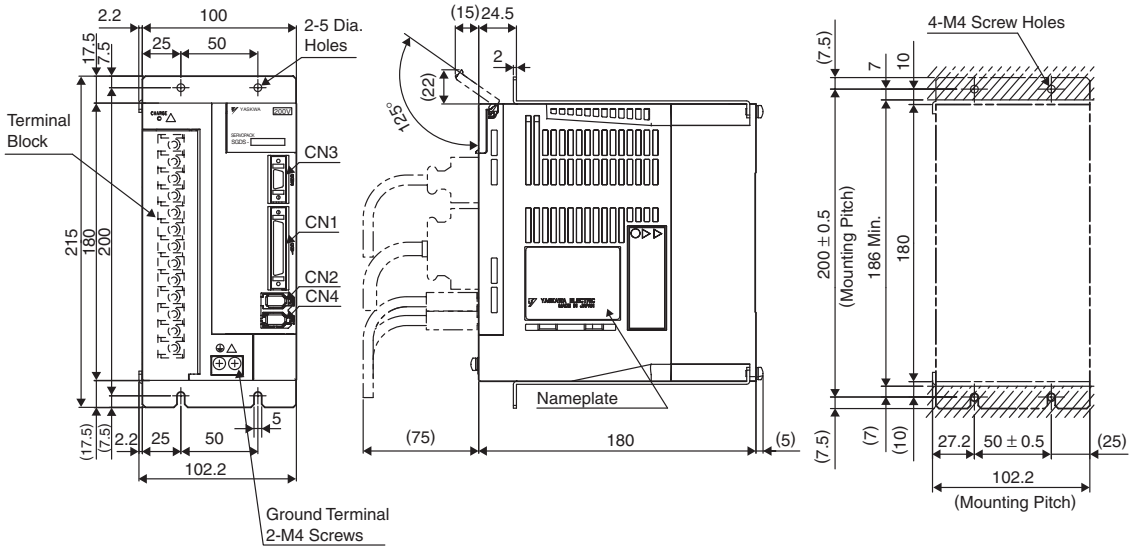


External Dimensions Units: mm

(6) Three-phase 200 V: 2.0 kW / 3.0 kW

Approx. Mass: 3.1 kg

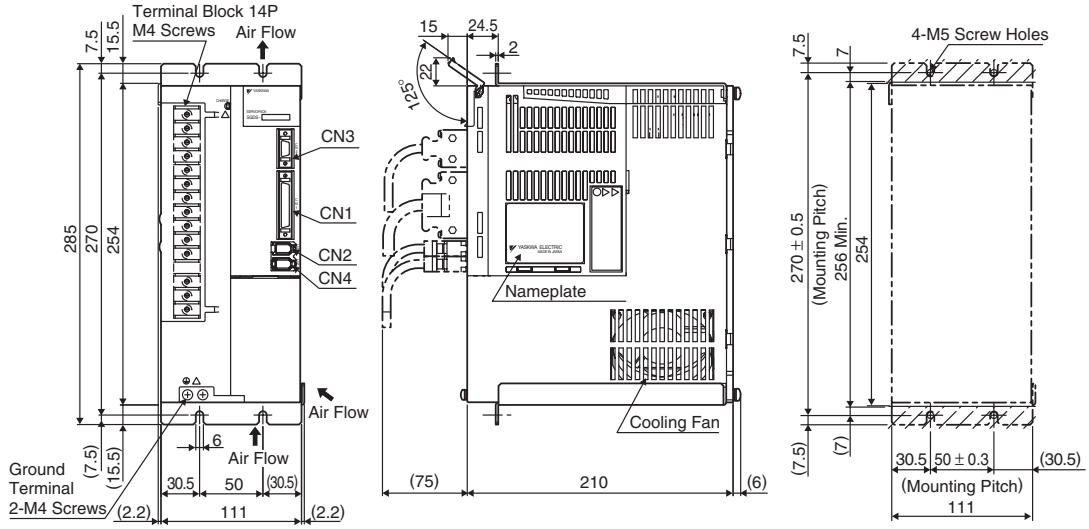
Mounting Hole Diagram



(7) Three-phase 200 V: 5.0 kW

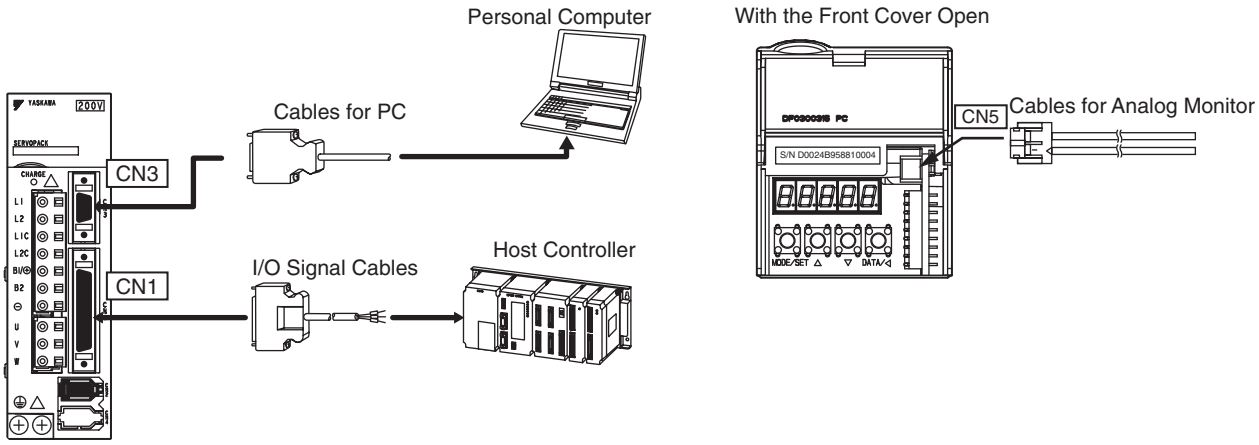
Approx. Mass: 5.3 kg

Mounting Hole Diagram



Selecting Cables

● Cable Connections to CN1 , CN3 , and CN5

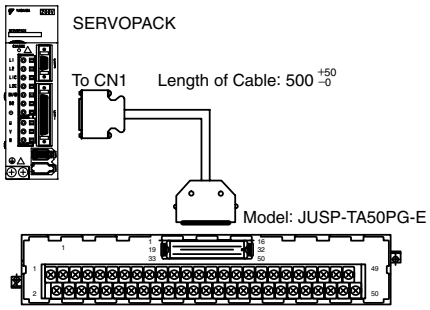


Name		Length	Order No.	Specifications	Details
To CN1 I/O Signal Cables	Connector Terminal Block Converter Unit		JUSP-TA50PG-E	Terminal Block Converter Unit and 0.5 m Connection Cable 	(1)
	Cable with Loose Wires at One End	1 m	JZSP-CSI01-1-E	Cable with Connector to SERVOPACK and Loose Wires 	(2)
		2 m	JZSP-CSI01-2-E		
		3 m	JZSP-CSI01-3-E		
	Connector Kit for CN1		JZSP-CSI9-1-E	Connector and Case	(3)
To CN3 Cables for PC		2 m	JZSP-CMS02-E	D-Sub 9-pin (for DOS/V) To Personal Computer To SERVOPACK 	(4)
To CN5 Cables for Analog Monitor		1 m	JZSP-CA01-E	To SERVOPACK 	(5)

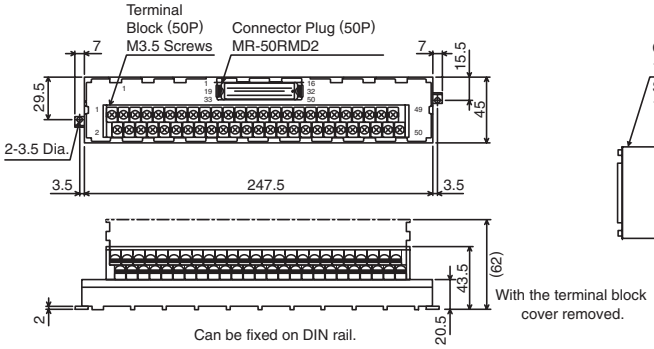
Selecting Cables Units: mm

(1) Connector Terminal Block Converter Unit (to CN1)

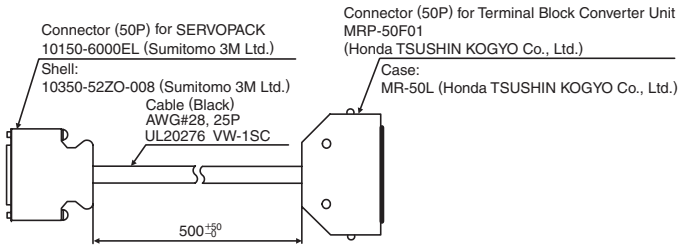
• Cable Connection



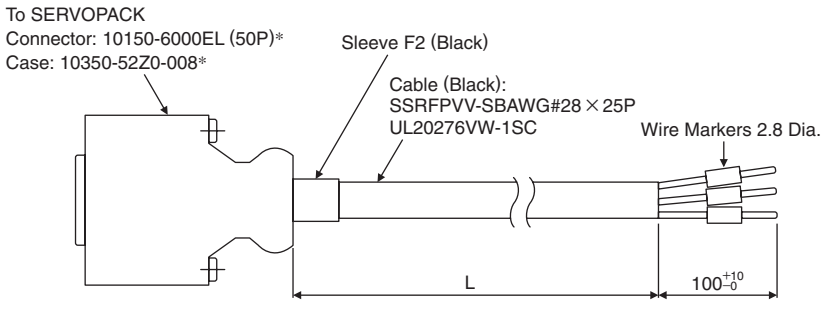
• Dimensional Drawings of Terminal Block



• Dimensional Drawings of Cable



(2) Cable with Loose Wires at One End (to CN1)



*: Manufactured by Sumitomo 3M Ltd.

Note: See the next page for the connection diagram.

(2) Cable with Loose Wires at One End (to CN1)
Connection Diagram of JZSP-CSI01-□ Cable

To SERVOPACK

Pin No.	Signal Name	Lead Color	Marking		Lead Marker
			Color	Dots	
1	SG	Orange	Red	1	1
3	—	Gray	Red	1	3
2	SG	Orange	Black	1	2
4	—	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	—	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	—	Yellow	Black	2	18
19	PCO	Pink	Red	2	19
20	/PCO	Pink	Black	2	20
21	—	Orange	Red	3	21
22	—	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				

To Host Controller

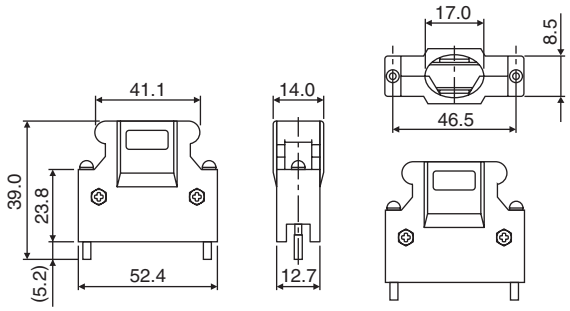
: represents twisted-pair wires.

(3) Connector Kit (for CN1)
Use the following connector and cable to assemble the cable. The CN1 connector kit includes one case and one connector.

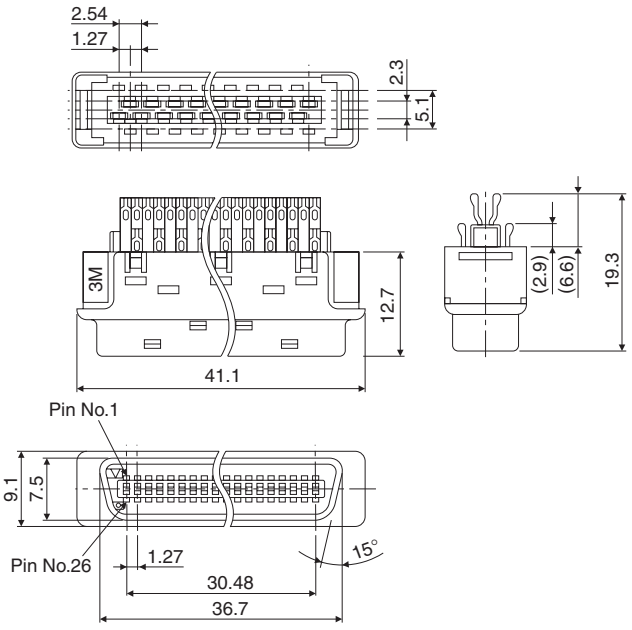
Connector Kit Model No.	Case		Connector	
	Model No.	Qty	Model No.	Qty
JZSP-CSI9-1	10350-52Z0-008*	1 set	10150-3000PE* (Soldered)	1

*: Manufactured by Sumitomo 3M Ltd.

• Dimensional Drawings of Case



• Dimensional Drawings of Connector

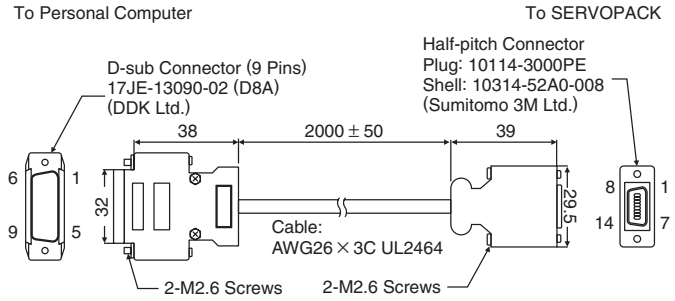


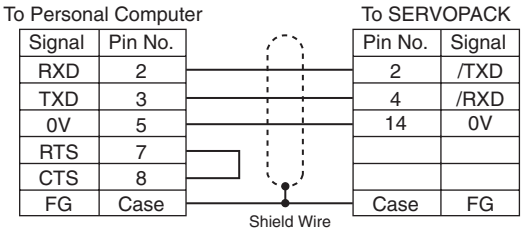
• Cable Size

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

Selecting Cables Units: mm

(4) Cable for DOS/V (to CN3)

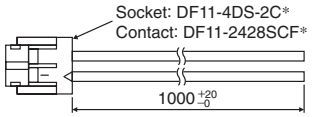




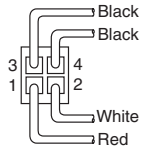
Signal	Pin No.		Pin No.	Signal
RXD	2		2	/TXD
TXD	3		4	/RXD
0V	5		14	0V
RTS	7			
CTS	8			
FG	Case		Case	FG

(5) Cables for Analog Monitor (to CN5)

・Dimensional Drawings



*: Manufactured by Hirose Electric Corporation.



View from Cable End

・Specifications

Cable Color	Signal Name	Remarks
White	Analog Monitor 1	Torque reference: 1 V/100% rated torque
Red	Analog Monitor 2	Motor speed: 1 V/1000 min^{-1}
Black (2 Cables)	GND	GND Analog monitor: 0 V

Selecting Cables

● Main Circuit Cables

(1) Single-phase for 100 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-		
		A5F	01F	02F
Main Circuit Power Supply Input Terminals	L1, L2	HIV1.25		HIV2.0
Servomotor Connection Terminals	U, V, W	HIV1.25		
Control Power Supply Input Terminals	L1C, L2C	HIV1.25		
External Regenerative Resistor Connection Terminals	B1/⊕, B2	HIV1.25		
Ground Terminal	⏚	HIV2.0 min.		

(2) Single-phase for 200 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-				
		A5A	01A	02A	04A	08A
Main Circuit Power Supply Input Terminals	L1, L2	HIV1.25			HIV2.0	
Servomotor Connection Terminals	U, V, W	HIV1.25				
Control Power Supply Input Terminals	L1C, L2C	HIV1.25				
External Regenerative Resistor Connection Terminals	B1/⊕, B2	HIV1.25				
Ground Terminal	⏚	HIV2.0 min.				

(3) Three-phase for 200 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-						
		05A	10A	15A	20A	30A	50A	75A
Main Circuit Power Supply Input Terminals	L1, L2, L3	HIV2.0			HIV3.5		HIV5.5	HIV14
Servomotor Connection Terminals	U, V, W	HIV2.0			HIV3.5	HIV5.5	HIV8.0	HIV14
Control Power Supply Input Terminals	L1C, L2C	HIV1.25						
External Regenerative Resistor Connection Terminals	B1/⊕, B2	HIV1.25			HIV2.0	HIV3.5	HIV5.5	HIV8.0
Ground Terminal	⏚	HIV2.0 min.						

∗: For SGDS-75A SERVOPACK, the external regenerative resistor connection terminals are B1 and B2.

The following table shows the wire size and allowable current for three cables. Use a cable whose specifications meet or are less than the values in the table.

・600 V Heat-resistant Vinyl Cables (HIV)

AWG Size	Nominal Cross Section Diameter mm²	Configuration Number of Wires/mm²	Conductive Resistance Ω/km	Allowable Current at Surrounding Air Temperature (A)		
				30℃	40℃	50℃
20	0.5	19/0.18	39.5	6.6	5.6	4.5
—	0.75	30/0.18	26.0	8.8	7.0	5.5
18	0.9	37/0.18	24.4	9.0	7.7	6.0
16	1.25	50/0.18	15.6	12.0	11.0	8.5
14	2.0	7/0.6	9.53	23	20	16
12	3.5	7/0.8	5.41	33	29	24
10	5.5	7/1.0	3.47	43	38	31
8	8.0	7/1.2	2.41	55	49	40
6	14.0	7/1.6	1.35	79	70	57

Note: The values in the table are only for reference.

IMPORTANT

1 Wire sizes were selected for three cables per bundle at 40˚C surrounding air temperature with the rated current.
2 Use cable with minimum withstand voltage of 600 V for main circuits.
3 If cables are bundled in PVC or metal ducts, consider the reduction ratio of the allowable current.
4 Use heat-resistant cables under high ambient or panel temperatures where normal vinyl cables will rapidly deteriorate.
5 Use cables within the allowable moment of inertia.
6 Do not use cables in continuous regenerating status.

Selecting Cables Units: mm

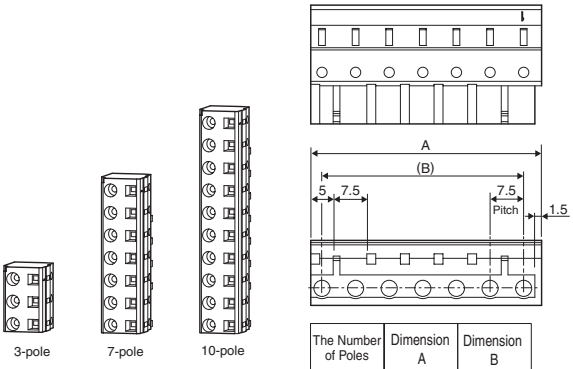
● Connectors of Main Circuit and Control Power Supply Cables and Servomotor Cable

(1) Spring Type (Standard)

・Connector Types

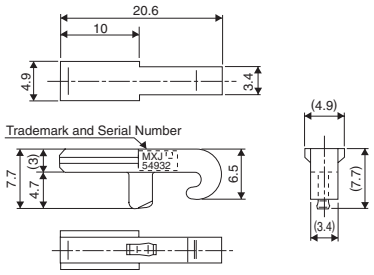
Appearance	Model No.	Manufacturer
3-pole (For servomotor main circuit cable connector to SERVOPACK)	51446-0301	Molex Japan Co., Ltd.
7-pole (For 50 W to 400 W SERVOPACKs)	51446-0701	
10-pole (For 0.5 kW to1.5 kW SERVOPACKs)	51446-1001	
Connection lever	54932-0000	

・External View and Dimensions



The Number of Poles	Dimension A	Dimension B
3	21.5	15
7	51.5	45
10	74	67.5

・Connection Lever



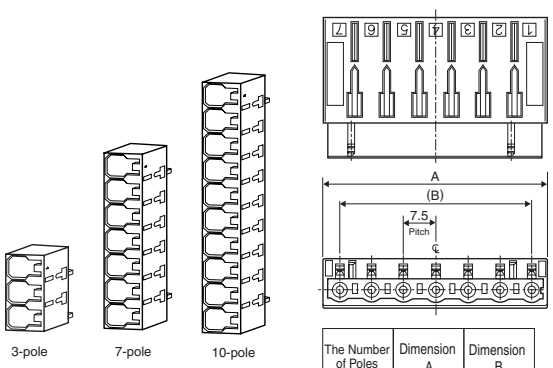
(2) Crimp Type (Optional)

The crimp type connectors are optional. Contact the manufacturer for details.

・Connector Types

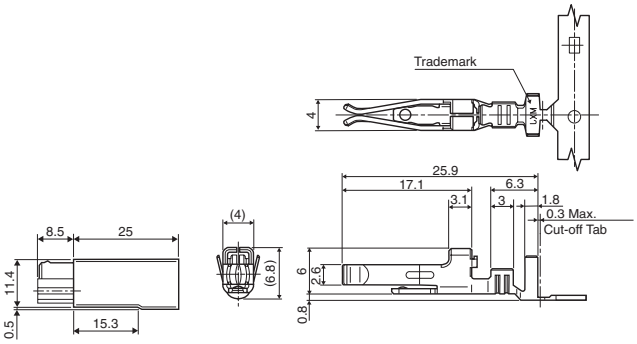
Appearance	Model No.	Manufacturer
3-pole (For servomotor main circuit cable connector to SERVOPACK)	51241-0301	Molex Japan Co., Ltd.
7-pole (For 50 W to 400 W SERVOPACKs)	51241-0701	
10-pole (For 0.5 kW to 1.5 kW SERVOPACKs)	51241-1001	
Plug (chained)	56125-0018	
Plug (detached)	56125-0118	
Manual tool	57349-5300	
Pull tool	57349-6000	

・External View and Dimensions

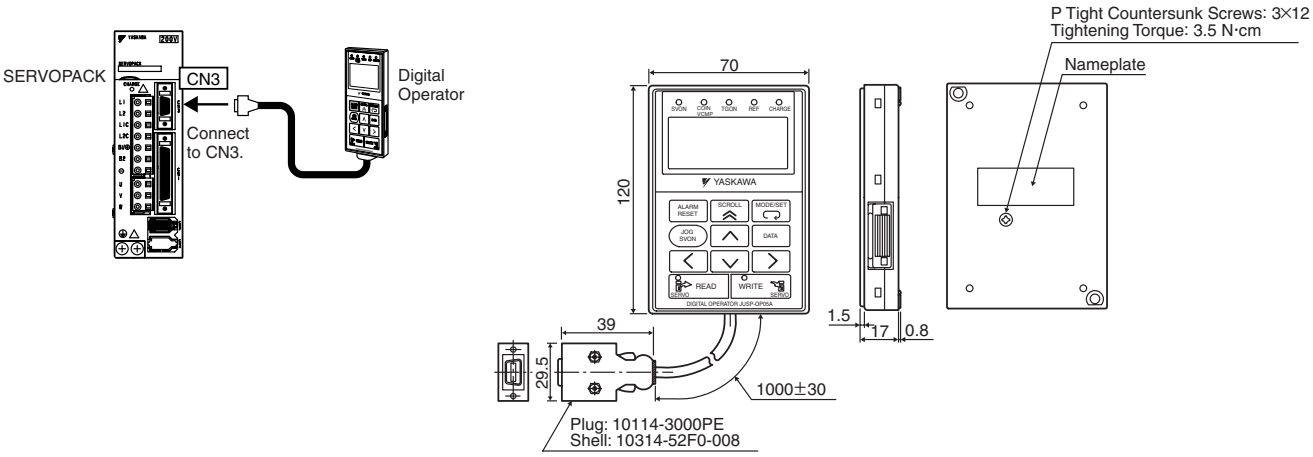


The Number of Poles	Dimension A	Dimension B
3	22.8	15
7	52.8	45
10	75.3	67.5

・Plugs (Chained/Detached)



● Digital Operator (Model: JUSP-OP05A)



● Molded-case Circuit Breaker and Fuse Capacity

Main Circuit Power Supply	SERVOPACK Model		Power Supply Capacity per SERVOPACK kVA	Current Capacity of Molded-case Circuit Breaker or Fuse *1, *2		Inrush Current	
	Capacity kW	SGDS-		Main Circuit Power Supply Arms	Control Circuit Power Supply Arms	Main Circuit Power Supply A	Control Circuit Power Supply A
Single-phase 100 V	0.03	A3B	0.25	4	0.26	14	30
	0.05	A5F					
	0.10	01F	0.40				
	0.20	02F	0.60	6			
	0.40	04F	1.2	12			
Single-phase 200 V	0.05	A5A	0.25	4	0.13	28	60
	0.10	01A	0.40				
	0.20	02A	0.75				
	0.40	04A	1.2	8			
	0.80	08A	2.2	16			
Three-phase 200 V	0.5	05A	1.4	4	0.15	28	60
	1.0	10A	2.3	7			
	1.5	15A	3.2	10			28
	2.0	20A	4.3	13			
	3.0	30A	5.9	17			
	5.0	50A	7.5	28		57	
	6.0	60A	12.5	32	0.27	94	
	7.5	75A	15.5	41			

*1: Nominal value at the rated load. The specified derating is required to select an appropriate fuse capacity.
*2: Cut-off characteristics (25℃): 200% for two seconds min. and 700% for 0.01 seconds min.
Note: Do not use a fast-acting fuse. Because the SERVOPOACK's power supply is a capacitor input type, a fast-acting fuse may blow when the power is turned on.

If selecting a molded-case circuit breaker, observe the following precautions.

IMPORTANT

■Ground Fault Detector
- Select ground fault detectors for inverters.
- High-frequency current leaks from the servomotor armature because of switching operation inside the SERVOPACK.

(1) Maximum Input Current

- The instantaneous maximum output of the SERVOPACK is approximately 3 times the rated output for a maximum of 3 seconds. Accordingly, select a molded-case circuit breaker whose breaking time is 5 seconds or more at 300% of SERVOPACK rated current. The general-purpose low-speed acting molded-case circuit breakers are applicable.
- The power supply capacity per SERVOPACK when using a servomotor is described in the table above.
  Select a molded-case circuit breaker with the capacity larger than the effective load current (when using multiple SERVOPACKs) calculated from the total power supply capacity .
- The consumption of other controllers must be considered when selecting a molded-case circuit breaker.

(2) Inrush Current

- Refer to the table above for SERVOPACK inrush current.
- The allowable inrush current for a low-speed acting molded-case circuit breaker is approximately 10 times the rated current for 0.02 seconds.
- When turning on multiple SERVOPACKs simultaneously, select a molded-case circuit breaker with the allowable current for 20 ms larger than the total inrush current shown in the table above.

Selecting Peripheral Devices

● Noise Filters, Magnetic Contactors, Surge Absorbers and AC/DC Reactors

Main Circuit Power Supply	SERVOPACK Model		Recommended Noise Filter		Magnetic Contactor	Surge Absorber	AC/DC Reactor
	Capacity kW	SGDS-	Model No.	Specifications			
Single-phase 100 V	0.05	A5F	FN2070-6/07	Single-phase, 250 VAC, 6 A	SC-03	R・C・M -601BQZ-4	X5053
	0.10	01F					
	0.20	02F	FN2070-10/07	Single-phase, 250 VAC, 10 A			X5054
	0.40	04F	FN2070-16/07	Single-phase, 250 VAC, 16 A	SC-4-1		X5056
Single-phase 200 V	0.05	A5A	FN2070-6/07	Single-phase, 250 VAC, 6 A	SC-03		X5052
	0.10	01A					
	0.20	02A					X5053
	0.40	04A	FN2070-10/07	Single-phase, 250 VAC, 10 A			X5054
	0.80	08A	FN2070-16/07	Single-phase, 250 VAC, 16 A	SC-4-1		X5056
Three-phase 200 V	0.5	05A	FN258L-7/07	Three-phase, 480 VAC, 7 A	SC-03	R・C・M -601BUZ-4	X5061
	1.0	10A	FN258L-16/07	Three-phase, 480 VAC, 16 A	SC-4-1		
	1.5	15A					X5060
	2.0	20A			SC-5-1		
	3.0	30A	FN258L-30/07	Three-phase, 480 VAC, 30 A			X5059
	5.0	50A	FMAC-0934-5010	Three-phase, 480 VAC, 50 A	SC-N1		X5068
	7.5	75A	FMAC-0953-6410	Three-phase, 440 VAC, 64 A	SC-N2		—
Details			(1)		(2)	(3)	(4)

Notes: 1 If multiple SERVOPACKs are wired at the same time, select the proper magnetic contactors according to the total capacity.
2 The following table shows the manufacturers of each device.

Peripheral Device	Manufacturer
Noise Filter	Schaffner EMC, Inc.
Magnetic Contactor	Fuji Electric FA Components & Systems Co., Ltd.
Surge Absorber	Okaya Electric Industries Co., Ltd. (Surge Protector)
AC/DC Reactor	Yaskawa Controls Co., Ltd.

● Regenerative Resistors

Main Circuit Power Supply	SERVOPACK Model		Regenerative Resistor		
	Capacity kW	SGDS-	Built-in		Externally Connected
			Resistance Ω	Capacity W	
Single-phase 100 V	0.05	A5F	None	None	—
	0.10	01F			
	0.20	02F			
	0.40	04F			
Single-phase 200 V	0.05	A5A	None	None	—
	0.10	01A			
	0.20	02A			
	0.40	04A			
	0.75	08A	50	60	
Three-phase 200 V	0.45	05A	50	40	—
	1.0	10A		60	
	1.5	15A	30	70	
	2.0	20A	25	140	
	3.0	30A	12.5		
	5.0	50A	8	180	
	7.5	75A	(3.13)*	(1760)*	JUSP-RA05
Details			(5)		

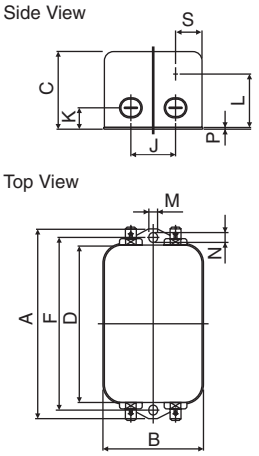
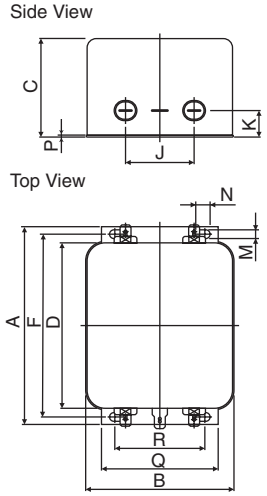
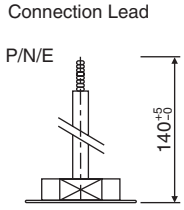
*: For the optional JUSP-RA05 Regenerative Resistor Unit.
Notes: 1 If the SERVOPACK cannot process the regenerative power, an external regenerative resistor is required. External regenerative resistors are required for SERVOPACKs with a capacity of 6.0 kW or more as a standard safety measure.
2 The following table shows the manufacturers of each device.

Peripheral Device	Manufacturer
External Regenerative Resistor	Iwaki Wireless Research Institute
External Regenerative Unit	Yaskawa Electric Corporation
Brake Power Supply Unit	Yaskawa Controls Co., Ltd.

(1) Noise Filter

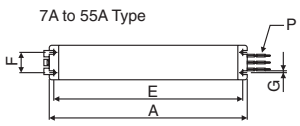
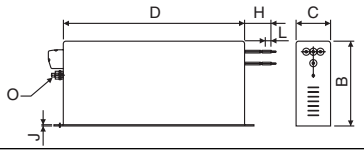
The recommended noise filter is manufactured by Schaffner EMC, Inc. (FN type) and Schurter, Inc. (formerly Timonta) (FMAC type).

・FN Type for Single-phase 100 V or 200 V

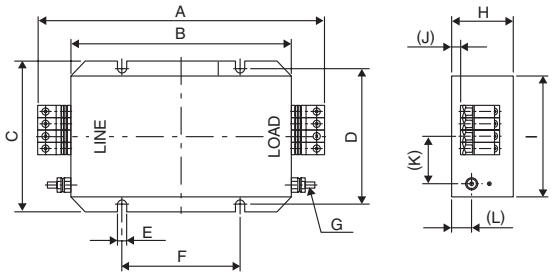
Model No.		FN2070-6/07	FN2070-10/07	FN2070-16/07
Dimensional Drawings				
				
External Dimensions	Symbol	Dimensions in mm		
	A	113.5±1	156±1	119±0.5
	B	57.5±1		85.5±1
	C	45.4±1.2		57.6±1
	D	94±1	130.5±1	98.5±1
	F	103±0.3	143±0.3	109±0.3
	J	25±0.2		40±0.2
	K	8.4±0.5		8.6±0.5
	L	32.4±0.5		—
	M	4.4±0.1	5.3±0.1	4.4±0.1
	N	6±0.1		7.4±0.1
	P	0.9±0.1		1.2±0.1
	Q	—		66±0.3
	R	—		51±0.2
	S	38±0.5		—
Specifications		250 VAC, 6 A	250 VAC, 10 A	250 VAC, 16 A
Applicable SERVOPACK SGDS-	Single-phase 100 V	A5F	02F	04F
		01F		
	Single-phase 200 V	A5A	04A	08A
		01A		
		02A		
Manufacturer		Schaffner EMC. Inc.		

Selecting Peripheral Devices

・FN Type for Three-phase 200 V

Model No.		FN258L-7/07	FN258L-16/07	FN258L-30/07
Dimensional Drawings		Side View 7A to 55A Type  Front and Side View 		
External Dimensions	Symbol	Dimensions in mm		
	A	225±1	305±1	335±1
	B	126±0.8	142±0.8	150±1
	C	50±0.6	55±0.6	60±0.6
	D	225±0.8	275±0.8	305±1
	E	240±0.5	290±0.5	320±0.5
	F	25±0.3	30±0.3	35±0.3
	G	6.5±0.2		
	H	300±10		400±10
	J	1±0.1		
	L	9±1		
	O	M5		
	P	AWG16	AWG14	AWG10
Specifications		480 VAC, 7 A	480 VAC, 16 A	480 VAC, 30 A
Applicable SERVOPACK SGDS-	Three-phase 200 V	05A	10A, 15A, 20A	30A
Manufacturer		Schaffner EMC. Inc.		

・FMAC Type for Three-phase 200 V

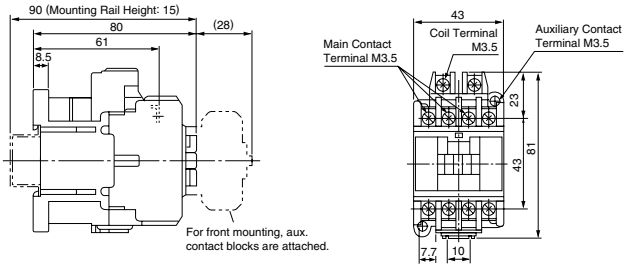
Model		FMAC-0934-5010	FMAC-0953-6410
Dimensional Drawings			
External Dimensions	Symbol	Dimensions in mm	
	A	251	308
	B	201	231
	C	151	151
	D	135^{+0}_{-1}	135^{+0}_{-1}
	E	6.5±0.3	6.5±0.3
	F	115±0.3	115±0.3
	G	M6	M6
	H	66	66
	I	121	121
	J	(10)	(13)
	K	(41)	(45)
	L	(17)	(34)
Specifications		440 VAC, 50 A	440 VAC, 64 A
Applicable SERVOPACK SGDS-	Three-Phase 200 V	50A	75A
Manufacturer		Schurter, Inc. (formerly Timonta)	

(2) Magnetic Contactor

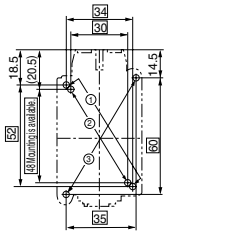
A magnetic contactor is required to externally activate the AC power for the SERVOPACK.
Be sure to attach a surge absorber to the excitation coil of the magnetic contactor.

・Model: SC-03

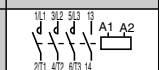
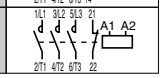
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.32 kg

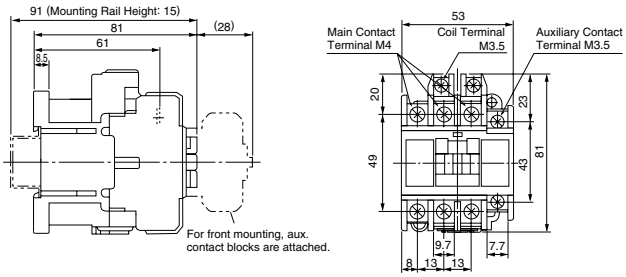


●Mounting methods: The following methods ①, ②, ③ are available.
①··· 34 × (48 to) 52
②··· 30 × 48
③··· 35 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

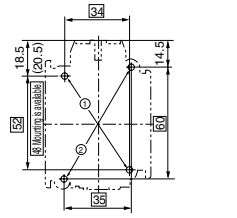
Auxiliary Contact	Structure
1a	
1b	

・Model: SC-4-1

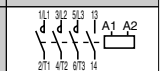
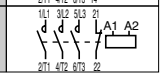
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.36 kg

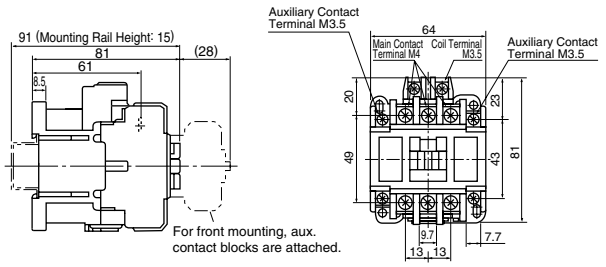


●Mounting methods: The following methods ①, ② are available.
①··· 34 × (48 to) 52
②··· 35 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

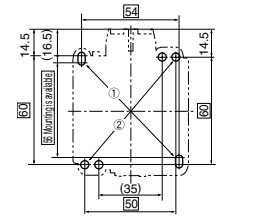
Auxiliary Contact	Structure
1a	
1b	

・Model: SC-5-1

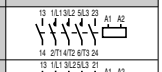
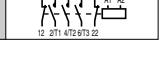
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.38 kg

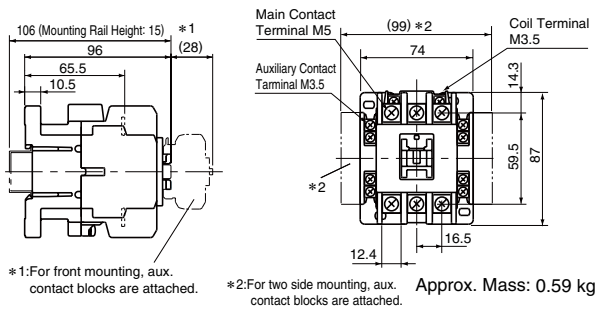


●Mounting methods: The following methods ①, ② are available.
①··· 54 × (56 to) 60
②··· 50 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

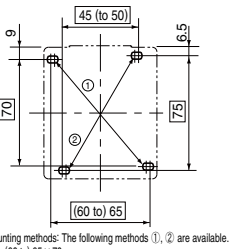
Auxiliary Contact	Structure
2a	
1a1b	
2b	

・Model: SC-N1, SC-N2

External Dimensions	Mounting Hole Dimensions	Terminal Symbols

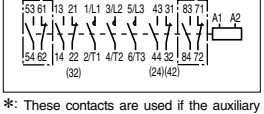


Approx. Mass: 0.59 kg



●Mounting methods: The following methods ①, ② are available.
①··· (60 to) 65 × 70
②··· 45 (to 50) × 75
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

Structure



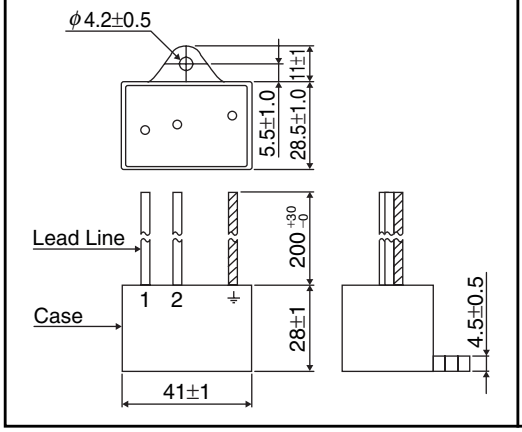
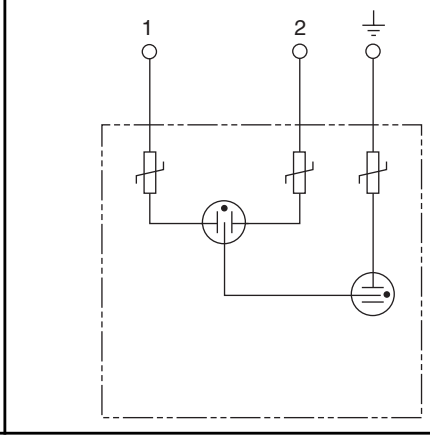
∗: These contacts are used if the auxiliary contacts consist of four normally open (NO) and four normally close (NC) contacts.
Note: The terminals of the auxiliary contacts are numbered differently than conventional terminals. The numbers in parentheses use the conventional method.

Selecting Peripheral Devices Units: mm

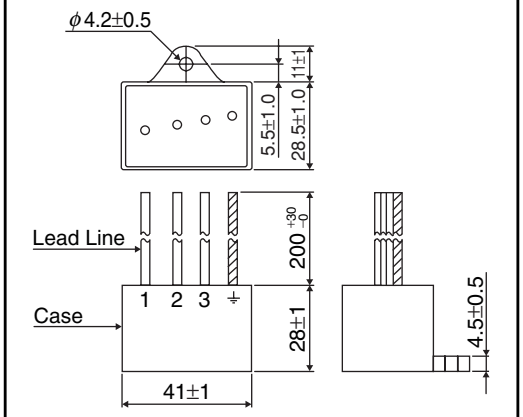
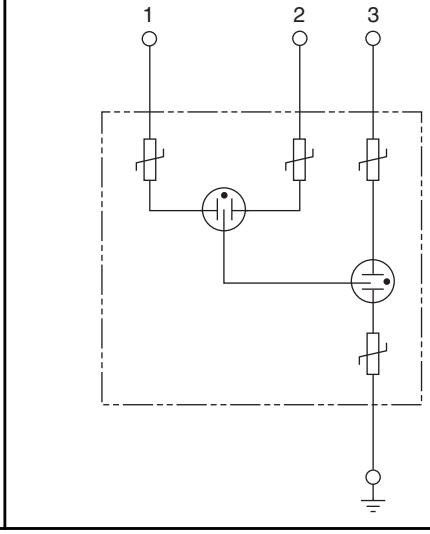
(3) Surge Absorber

The surge absorber absorbs switching surge and prevents faulty operation in or damage to electronic circuits. Recommended surge absorbers (for lightning surge) are listed below.

・Model: R・C・M-601BQZ-4

Dimensional Drawings	Internal Connection Diagram
	

・Model: R・C・M-601BUZ-4

Dimensional Drawings	Internal Connection Diagram
	

(4) AC/DC Reactors for Power Supply Harmonic Suppression

Manufactured by Yaskawa Controls Co., Ltd. Contact your Yaskawa representative for details.

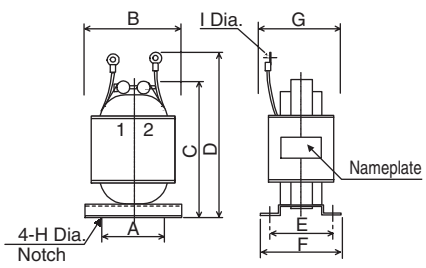
If the power supply harmonic suppression is needed, connect an AC reactor to the AC line for the single-phase input, or connect a DC reactor between the SERVOPACK main circuit terminals ⊖1 and ⊖2 for the three-phase input.

Select a reactor that matches the ratings of the SERVOPACK.

・Specifications

Applicable SERVOPACK Model SGDS-		AC/DC Reactor Model	Reactor Specifications	
			Inductance mH	Rated Current A
Single-phase 100 V	A3B	X5052	45.0	1.0
	A5F	X5053	20.0	2.0
	01F			
	02F	X5054	5.0	3.0
	04F	X5056	2.0	5.0
Single-phase 200 V	A5A	X5052	45.0	1.0
	01A			
	02A	X5053	20.0	2.0
	04A	X5054	5.0	3.0
	08A	X5056	2.0	5.0
Three-phase 200 V	05A	X5061	2.0	4.8
	10A			
	15A	X5060	1.5	8.8
	20A			
	30A	X5059	1.0	14.0
	50A	X5068	0.47	26.8
	60A	—	—	—
	75A			

・Dimensional Drawings



Reactor Model	Dimensions in mm									Approx. Mass kg
	A	B	C	D	E	F	G	H	I	
X5052	35	52	80	95	30	40	45	4	4.3	0.4
X5053	35	52	90	105	35	45	50	4	4.3	0.6
X5054	35	52	80	95	30	40	45	4	4.5	0.4
X5056	35	52	80	95	30	40	45	4	4.3	0.4
X5059	50	74	125	140	35	45	60	5	5.3	1.1
X5060	40	59	105	125	45	60	65	4	4.3	1.0
X5061	35	52	80	95	35	45	50	4	4.3	0.5
X5068	50	74	125	155	53	66	75	5	6.4	1.9

Selecting Peripheral Devices Units: mm

(5) External Regenerative Resistor

When regenerative energy is so large that a SERVOPACK cannot process, install externally a regenerative resistor. The regenerative resistor must be provided by the customers.

• Example:External Regenerative Resistor
(by Iwaki Musen Kenkyusho Co., Ltd.)

Regenerative Resistor Model	Specifications	Manufacturer
RH120	70 W, 1 to 100Ω	Iwaki Musen Kenkyusho Co., Ltd.
RH150	90 W, 1 to 100Ω	
RH220	120 W, 1 to 100Ω	
RH330C	200 W, 1 to 10 kΩ	
RH500	300 W, 1 to 30Ω	

• Specifications

Resistance Tolerance	K: ±10%, J: ±5%, H: ±3%
Temperature Resistance Characteristics	±400 PPM/℃ (20Ω max.), ±260 PPM/℃ (20Ω min.)
Withstand Voltage	2000 VAC/min, △R: ± (0.1%+0.05Ω)
Insulation Resistance	500 VDC, 20 MΩ min.
Short-time Overload	When 10 times of rated power is applied for five seconds, △R: ±(2% + 0.05Ω)
Life	1000 hours of repeating the operation ON for 90 minutes and OFF for 30 minutes, △R: ±(5% + 0.05Ω)
Heat Resistance	Not ignite after having applied 10 times of rated electric power for one minute
Operating Temperature	−25℃ to 150℃

• Model Designation

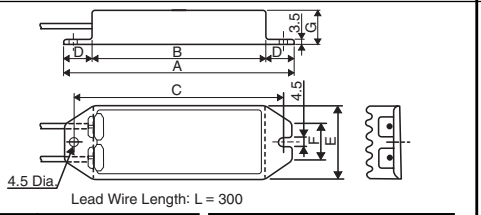
RH120 (N) 10Ω J

- RH120 (N): Model — N: Noninductive Winding
- 10Ω: Resistance
- J: Resistance Tolerance

Code	Specifications
K	±10%
J	±5%
H	±3%

• External Dimensions

RH120, 150, 220

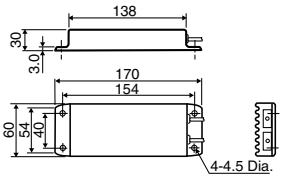


Lead Wire Length: L = 300

Model	Rated Power	Resistance
RH120	70 W	1Ω to 100Ω
RH150	90 W	1Ω to 100Ω
RH220	120 W	1Ω to 100Ω

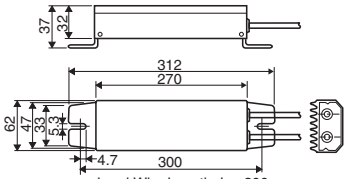
Model	A	B	C	D	E	F	G
RH120	182	150	172	16	42	22	20
RH150	212	180	202	16	44	24	30
RH220	230	200	220	15	60	24	20

RH220B



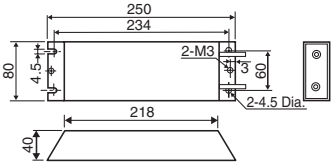
Lead Wire Length: L = 500
Rated Power: 120 W
Resistance: 1Ω to 100Ω

RH300C



Lead Wire Length: L = 300
Rated Power: 200 W
Resistance: 1Ω to 10 kΩ

RH500

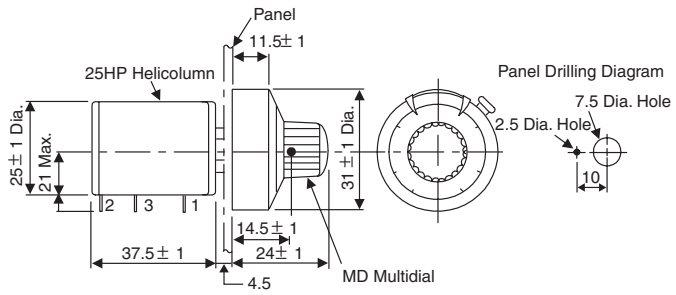


Lead Wire Length: L = 450
Rated Power: 300 W
Resistance: 1Ω to 30Ω

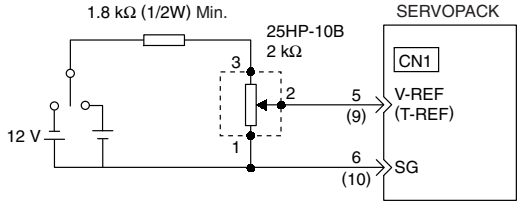
(6) Variable Resistor for Speed and Torque Setting (Model: 25HP-10B)

The multi-turn type winding variable resistors with dial MD10-30B4 are manufactured by Sakae Tsushin Kogyo Co., Ltd.

• External Dimensions



• Connection Example to an External Power Supply



SERVOPACKs

For Linear Servomotors

SGDS-□□□15

(MECHATROLINK-Ⅱ Communications)

The SGDS-□□□15 SERVOPACK is compatible with the MECHATROLINK-Ⅱ high-speed motion field network.
MECHATROLINK-Ⅱ enables real-time communications at low cost for high-precision motion control.

Features

● Real-time communications

MECHATROLINK-Ⅱ communications enable high-speed control for 30 stations at a maximum transmission speed of 10 Mbps in a transmission cycle from 250 μs to 4 ms (user setting). Such a high transmission speed allows real time transmission of various kinds of data required for control.

● Cost savings

Up to 30 stations can be connected in one MECHATROLINK-Ⅱ transmission line, which greatly reduces wiring costs and time. Only one signal connector is required on the host controller. And, the all-digital network eliminates the need for conversion from digital to analog for speed/force reference and for a pulse generator for position reference.

● High-precision motion control

The SGDS-□□□15 SERVOPACK connected to the host controller in the MECHATROLINK-Ⅱ network provides not only torque control, position control, and speed control but also synchronized phase control that requires advanced control technology. The fully-closed control system of the external encoder enables the machine to make extremely smooth motions

Model Designation

SGDS - A5 A 15 A □

Σ-Ⅲ Series
SGDS SERVOPACK

Max. Rated Output of
Applicable Servomotor

Code	Specifications
A5	50 W
01	100 W
02	200 W
04	400 W
05	500 W
08	750 W
10	1.0 kW
15	1.5 kW
20	2.0 kW
30	3.0 kW
50	5.0 kW
75	7.5 kW

Supply Voltage

Code	Specifications
A	200 VAC
F	100 VAC (100-V input, 200-V output: Doubled voltage)

Interface
15 : MECHATROLINK-Ⅱ communications
(For linear servomotors)

Design Revision Order
A, B, ...

Mounting Method
Blank : Base-mounted
R : Rack-mounted

Ratings and Specifications

SERVOPACK Model SGDS-				A5	01	02	04	05	08	10	15	20	30	50	75
Basic Specifications	Max. Applicable Servomotor Capacity kW			0.05	0.1	0.2	0.4	0.5	0.75	1.0	1.5	2.0	3.0	5.0	7.5
	100 V	Continuous Output Current Arms		0.66	0.91	2.1	2.8	—							
		Max. Output Current Arms		2.1	2.8	6.5	8.5	—							
	200 V	Continuous Output Current Arms		0.66	0.91	2.1	2.8	3.8	5.5	7.6	11.6	18.5	18.9	32.9	54.7
		Max. Output Current Arms		2.1	2.8	6.5	8.5	11.0	16.9	17.0	28.0	42.0	56.0	84.0	130.0
	Input Power Supply	SERVOPACK Capacity Range for 100/200 V		Single-phase 100 VAC							—				
				Single-phase 200 VAC				—	Single-phase 200 VAC	—					
				—				Three-phase 200 VAC	—	Three-phase 200 VAC					
		200 V	Main Circuit	Three-phase (or 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											
		100 V	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											
	Control Method			Single or three-phase full-wave rectification IGBT-PWM (sine-wave driven)											
	Feedback			1/256 data of serial converter unit sine wave pitch (incremental)											
	Operating Conditions	Surrounding Air/Storage Temperature		0℃ to +55℃/−20℃ to +85℃											
		Ambient/Storage Humidity		90% RH or less (with no condensation)											
		Vibration/Shock Resistance		4.9 m/s²/19.6 m/s²											
	Configuration			Base-mounted (Rack mounting available as an option for SGDS-A5 to -50)											
	Performance	Speed Control Range		1:5000 (The lowest speed of the speed control range is the speed at which the servomotor will not stop with a rated force load.)											
		Speed Regulation*	Load Regulation	0 to 100% load: ±0.01% max. (at rated speed)											
			Voltage Regulation	Rated voltage ±10% : 0% (at rated speed)											
			Temperature Regulation	25 ±25℃: ±0.1% max. (at rated speed)											
		Frequency Characteristics		600 Hz (at $J_L = J_M$)											
		Force Control Tolerance (Repeatability)		±1%											
		Soft Start Time Setting		0 to 10 s (Can be set individually for acceleraton and deceleration.)											
Built-in Functions	Dynamic Brake (DB)			Operated at main power OFF, servo alarm, servo OFF or overtravel											
	Regenerative Processing			External regenerative resistor				Built-in						External regenerative resistor	
	Overtravel Prevention (OT)			Dynamic brake stop at P-OT or N-OT, deceleration to a stop, or free run to a stop											
	Electronic Gear			0.001≦B/A≦1000											
	Protection			Overcurrent, overvoltage, low voltage, overload, regeneration error, main circuit sensor error, heat sink overheat, power phase loss, position error pulse overflow, overspeed, encoder error, overrun detection, CPU error, parameter error, and so on.											
	LED Display			CHARGE, five 7-segment LEDs (built-in Digital Operator functions)											
	Others			Reverse connection, zero position search, automatic motor discrimination function											

*: 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 variations or amplifier drift and changes in processing resistance due to temperature variation.
The ratio of speed changes to the rated speed represents speed regulation due to voltage and temperature variations.

Ratings and Specifications

Applicable SERVOPACK Model			SGDS-□□□15□ All Capacities	
MECHATROLINK Communications		Communications Protocol	MECHATROLINK-Ⅱ	MECHATROLINK-Ⅰ
		Station Address	41H to 5FH (Max. number of slaves: 30)	41H to 4FH (Max. number of slaves: 15)
		Transmission Speed	10 Mbps	4 Mbps
		Transmission Cycle	250 μs, 0.5 ms to 4 ms (multiple of 0.5 ms) (In accordance with the setting of the host controller)	2 ms
		Number of Words for Link Transmission	Can be switched between 17-byte/station and 32-byte/station by the setting of bit 2 for the SW2 switch.	17-byte/station
Command Method		Performance	Position control, speed control, and torque control through MECHATROLINK-Ⅱ communications	Position control through MECHATRIOLINK-Ⅰ communications
		Command Input	MECHATROLINK-Ⅰ commands and MECHATROLINK-Ⅱ commands (For sequence, motion, date setting/reference, monitor, adjustment, and other commands.)	
Functions for Position Control		Acceleration/ Deceleration Function	Linear 1st and 2nd step asymmetrical acceleration/deceleration, exponential function position reference filter, and movement average position reference filter	
I/O Signals	Sequence Input	Signal allocation can be modified.	Select any seven of the following signals: forward run prohibited (P-OT), reverse run prohibited (N-OT), homing deceleration limit switch, external latch signal 1, 2, 3, forward external torque limit, or reverse external torque limit	
	Sequence Output	Fixed Output	Alarm	
		Signal allocation can be modified.	Select any three of the following signals: positioning completion (speed coincidence), rotation detection, speed limit detection, servo ready, torque limit, release brake, warning, or NEAR singal	
	Position Output	Form	Phase-A, -B, -C: line driver output	
		Frequency Dividing Ratio	Any Setting Ratio	
Others	Analong Monitor (CN5)		Output voltage: ±8 VDC Analog monitor connector built in for monitoring speed, torque, and other reference signals. Speed: 1 V/1000 min^{-1} Torque: 1 V/rated torque Position error pulse: 0.05 V/reference unit	
	Communications	Interface	Digital Operator (hand type)	
		Function	Status display, parameter setting, monitor display, alarm traceback display, JOG operation	

● 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	Maximum Applicable Servomotor Capacity kW	SERVOPACK Model SGDS-	Power Supply Capacity kVA	Output Current (Effective Value) A	Main Circuit Power Loss W	Regenerative Resistor Power Loss*1 W	Control Circuit Power Loss W	Total Power Loss W
Single-phase 100 V	0.05	A5F	0.25	0.66	5.2	*2	13	18.2
	0.10	01F	0.40	0.91	12			25
	0.20	02F	0.60	2.1	16.4			29.4
	0.40	04F	1.2	2.8	24			37
Single-phase 200 V	0.05	A5A	0.25	0.66	4.6			17.6
	0.10	01A	0.40	0.91	6.7			19.7
	0.20	02A	0.75	2.1	13.3			26.3
	0.40	04A	1.2	2.8	20			33
	0.75	08A	2.2	5.5	47	12	15	74
Three-phase 200 V	0.5	05A	1.4	3.8	27	8		54
	1.0	10A	2.3	7.6	55	12		82
	1.5	15A	3.2	11.6	92	14		121
	2.0	20A	4.3	18.5	120	28		163
	3.0	30A	5.9	24.8	155	28		198
	5.0	50A	7.5	32.8	255	36	19	310
	7.5	75A	15.5	54.7	455	*3		474

*1: Regenerative resistor power losses are allowable losses. Take the following action if this value is exceeded.
- Remove the lead from the internal regenerative resistor in the SERVOPACK.
- Install an external regenerative resistor.

An external regenerative resistor is available as an option.

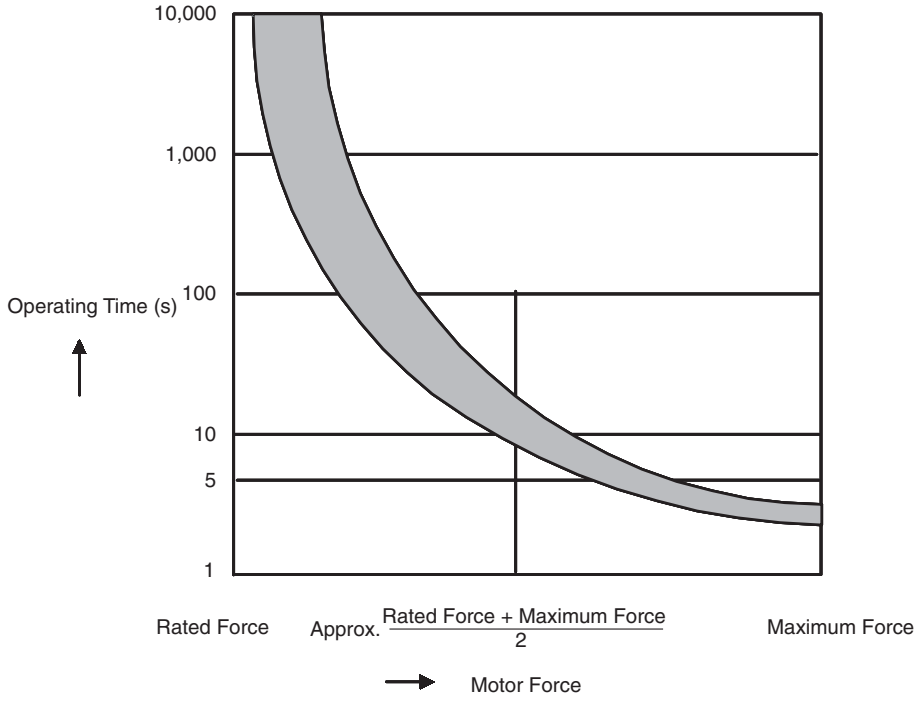
*2: SERVOPACKs with a capacity of 50 to 400 W do not have built-in regenerative resistors. If the regenerative energy exceeds the specified value, connect an external regenerative resistor.

*3: Install an external regenerative resistor when using the SERVOPACK with capacity of 6.0 kw or more.
The following regenerative resistor can be used:
- JUSP-RA05:For SGDS-75A(Allowable power loss 350 W)

Ratings and Specifications

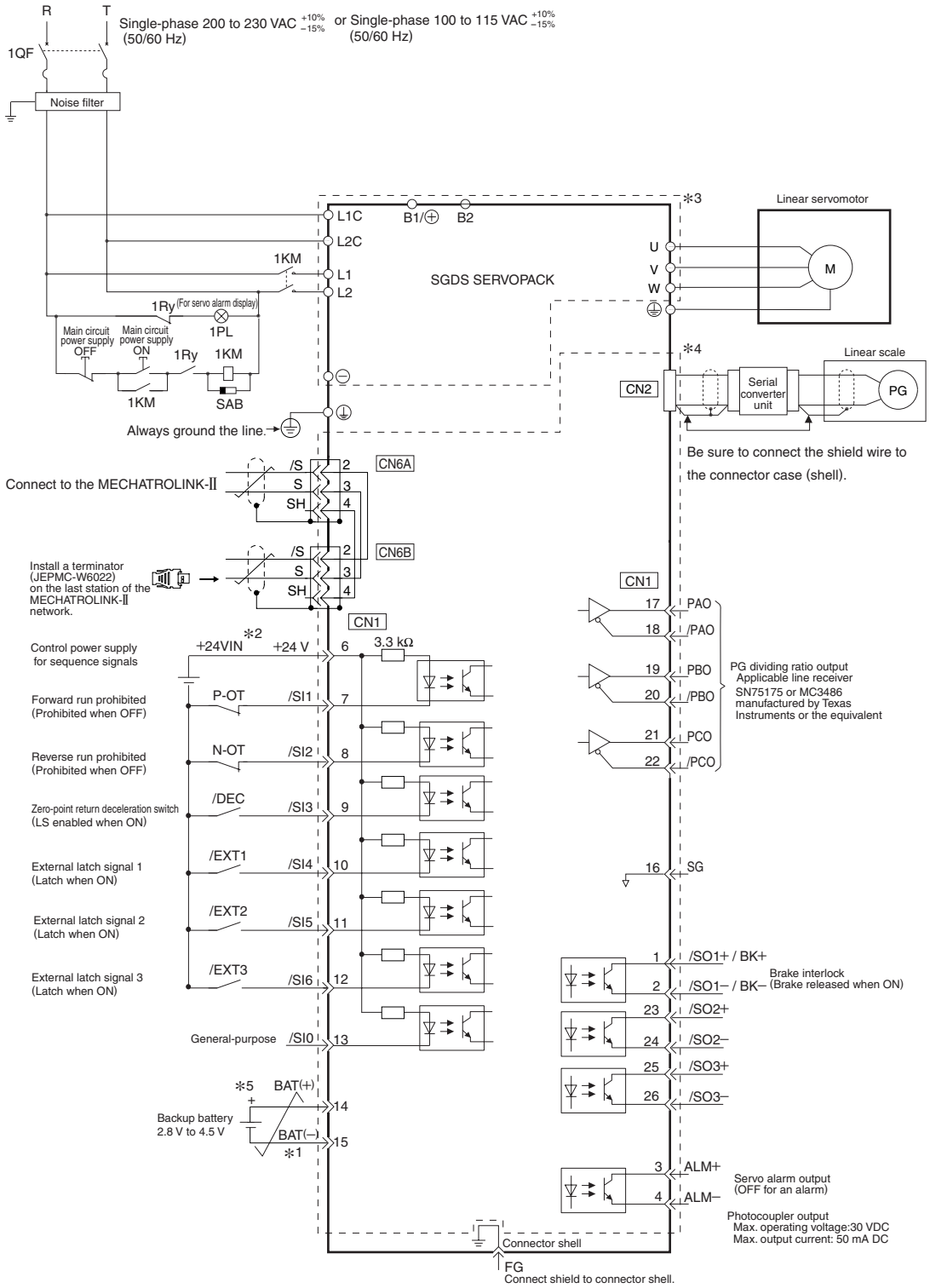
● Overload Characteristics

The overload detection level is set under hot start conditions at a servomotor surrounding air temperature of 40℃.



Connection Examples

● Single-phase 100 VAC or 200 VAC Power Supply



*1: ⫽ represents twisted-pair wires.

*2: A 24-VDC power supply with double-shielded enclosure is provided by the customers.

*3: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.

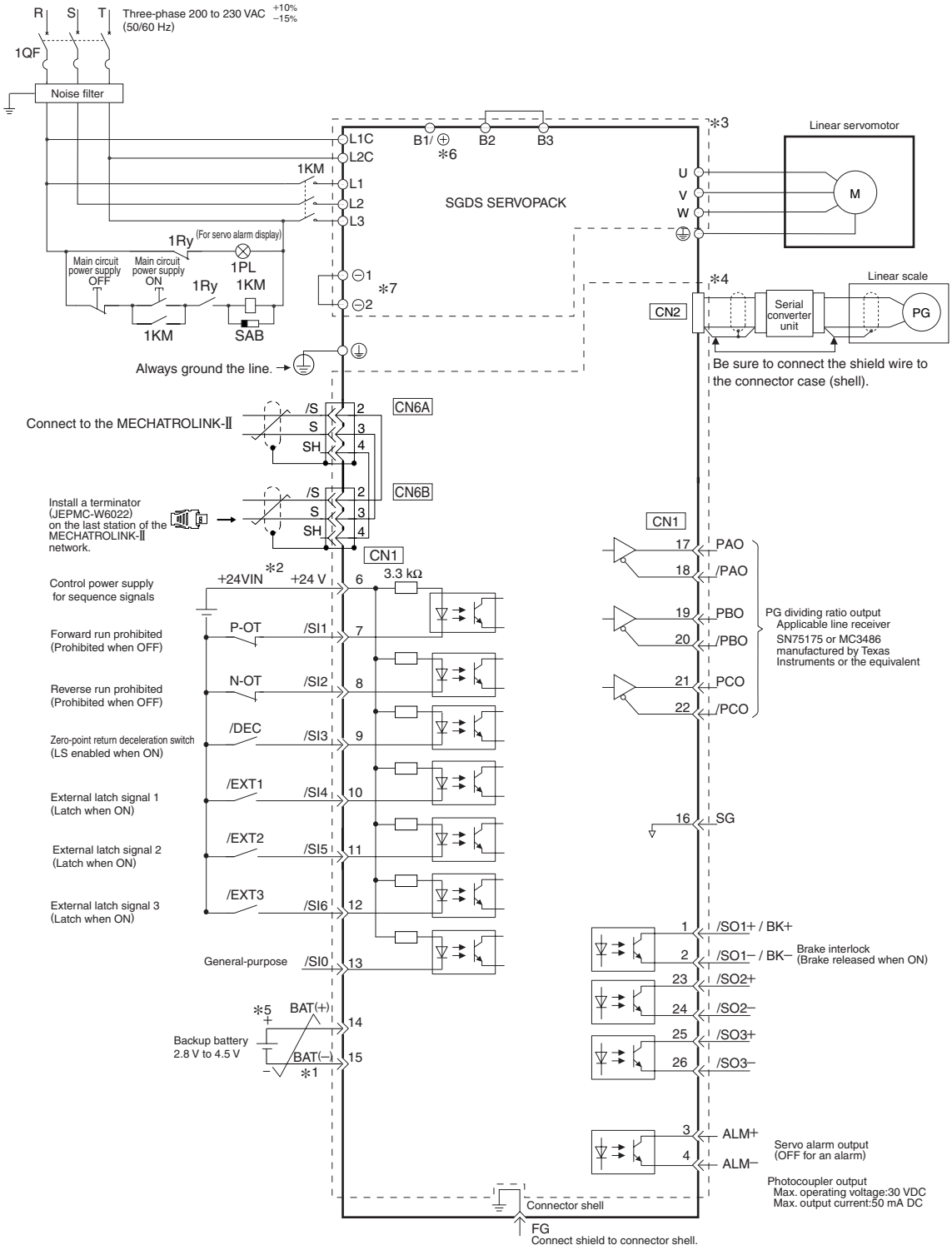
*4: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.

*5: Connect these terminals to a back-up battery using an external power supply if using an absolute encoder. When an encoder cable with a battery case is used, do not connect a backup battery.

Note: The functions allocated to the output signals /SO2 and /SO3 can be changed by using the parameters.

Connection Examples

● Three-phase 200 VAC Power Supply



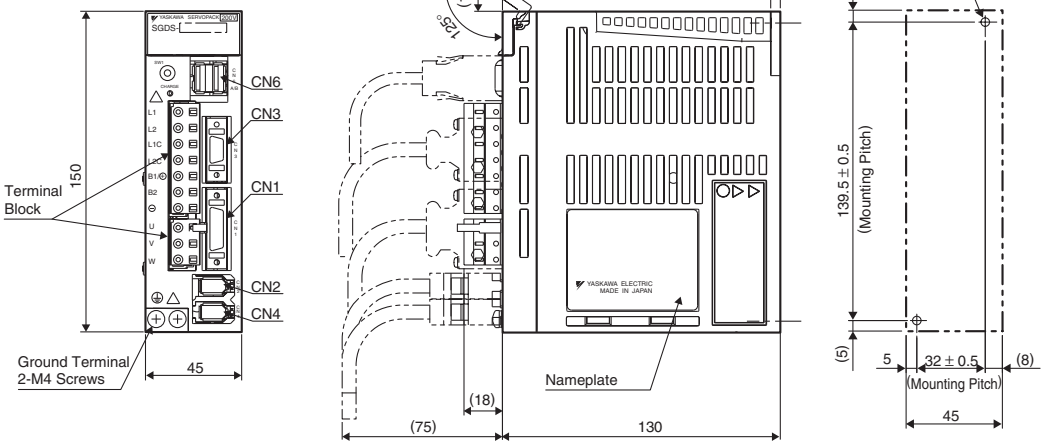
∗1: ⫽ represents twisted-pair wires.
∗2: A 24-VDC power supply with double-shielded enclosure is provided by the customers.
∗3: This circuit is insulated and protected in order to avoid electric shock in case of accidental contact.
∗4: SELV (Safety-Extra-Low Voltage) circuit. This circuit is insulated and protected from the other circuit by double insulation or reinforced insulation.
∗5: Connect these terminals to a back-up battery using an external power supply if using an absolute encoder. When an encoder cable with a battery case is used, do not connect a backup battery.
∗6: If an external regenerative resistor is required, disconnect the wiring between the SERVOPACK's B2 and B3 terminals and connect an external regenerative resistor between the B1/⊕ and B2 terminals.
∗7: Connect a DC reactor for harmonic suppression between the SERVOPACK's ⊖1 and ⊖2 terminals.
Note: The functions allocated to the output signals /SO2 and /SO3 can be changed by using the parameters.

Extenal Dimensions Units: mm

- Base-mounted SERVOPACKs

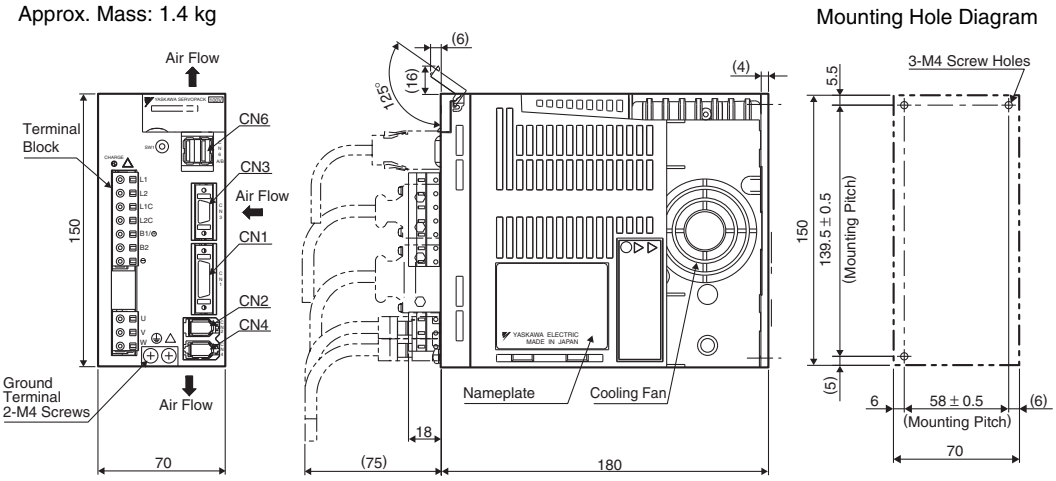
(1) Single-phase 100 V: 30 W
Single-phase 100/200 V: 50 W to 200 W

Approx. Mass: 0.7 kg



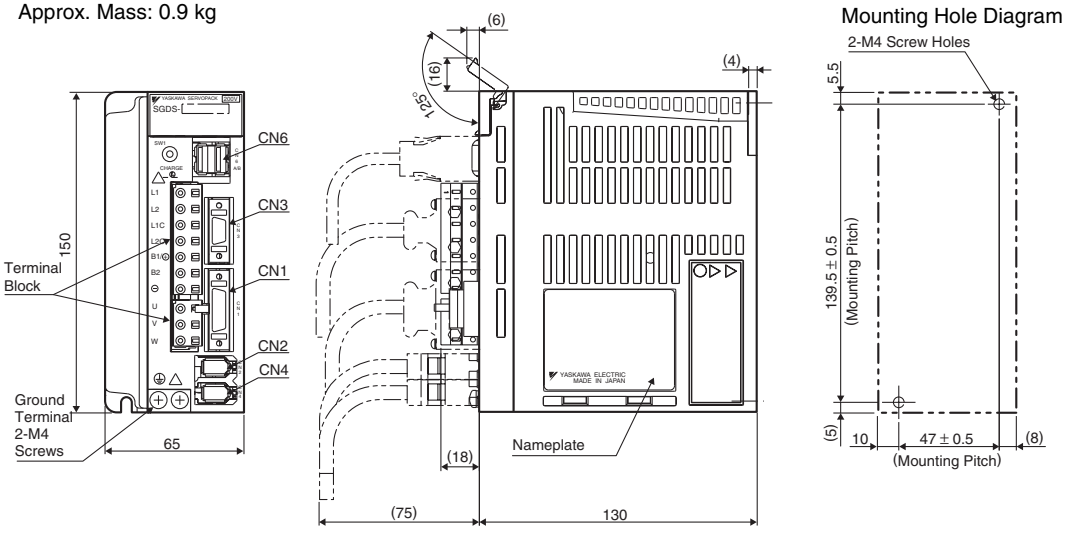
(2) Single-phase 100 V: 400 W

Approx. Mass: 1.4 kg



(3) Single-phase 200 V: 400 W

Approx. Mass: 0.9 kg



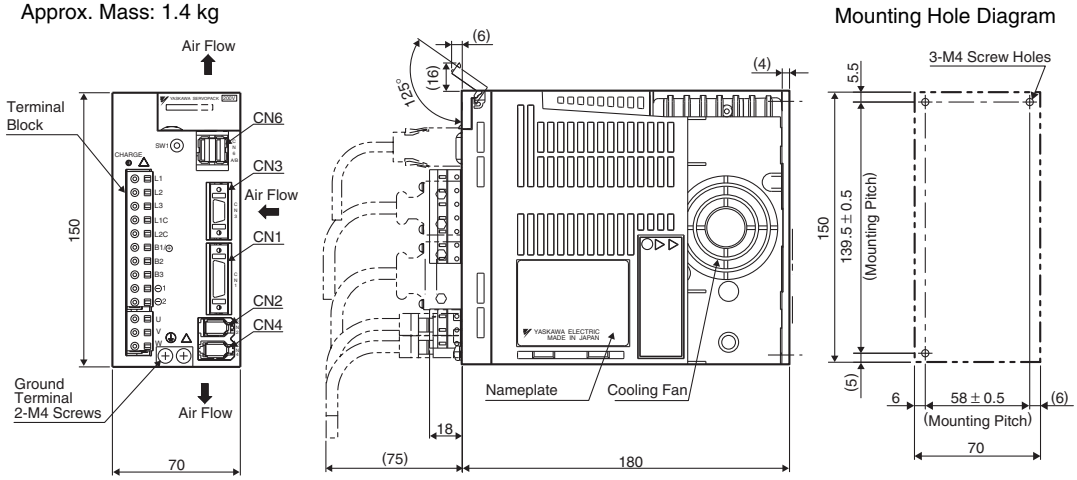
External Dimensions Units: mm

(4) Single-phase 200 V: 750 W
Three-phase 200 V: 500 W, 1.0 kW

Note: Do not use the L3 terminal of the single-phase 200 V, 750 W SERVOPACK.

Approx. Mass: 1.4 kg

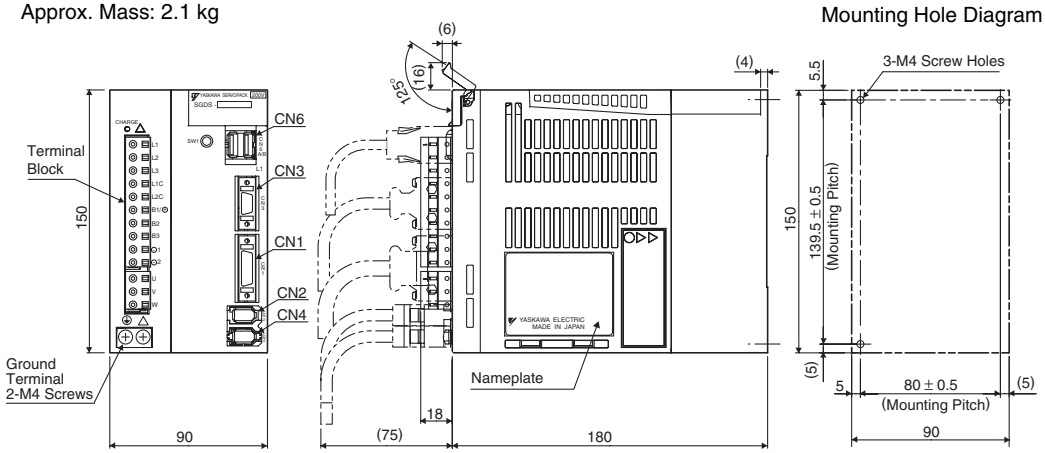
Mounting Hole Diagram



(5) Three-phase 200 V: 1.5 kW

Approx. Mass: 2.1 kg

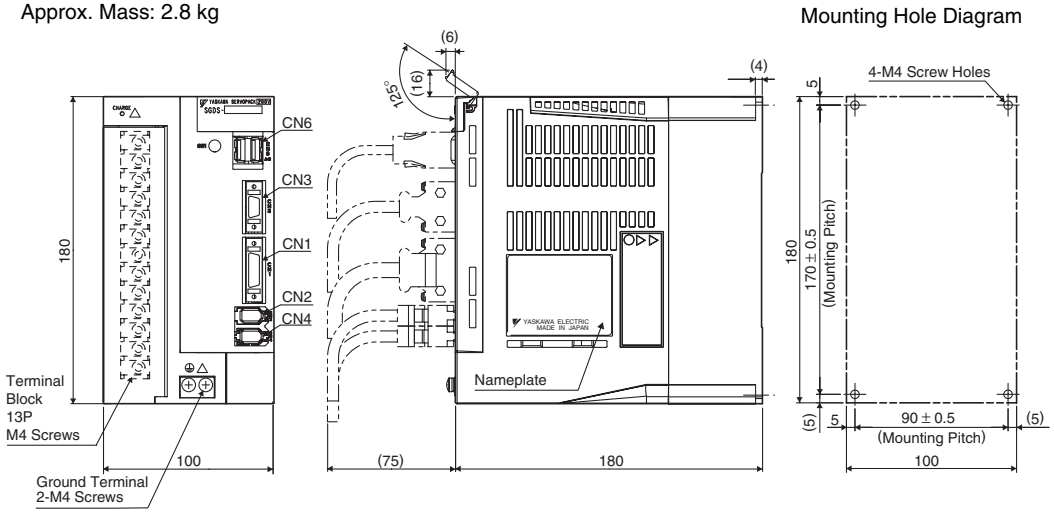
Mounting Hole Diagram



(6) Three-phase 200 V: 2.0 kW, 3.0 kW

Approx. Mass: 2.8 kg

Mounting Hole Diagram

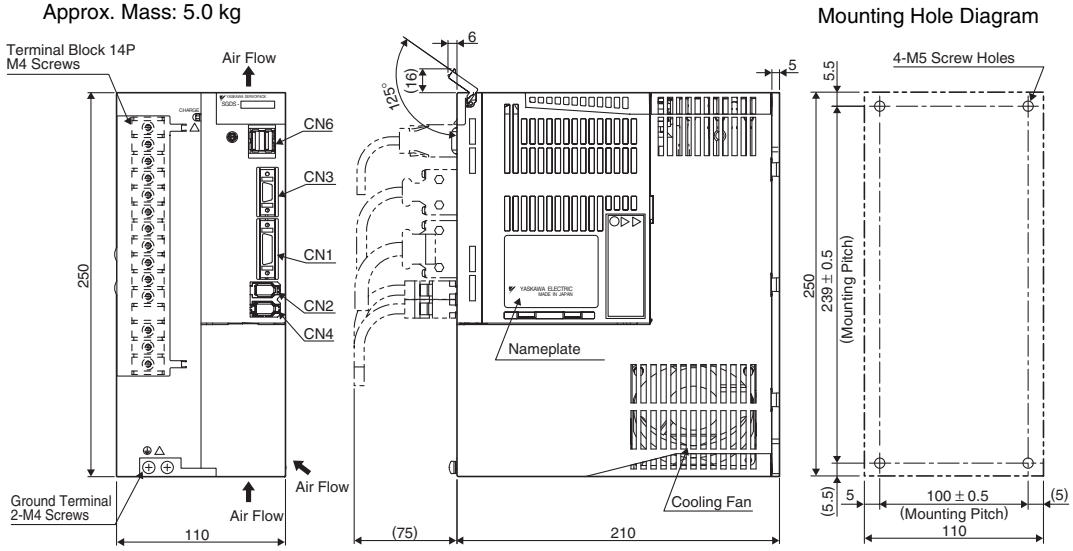


External Dimensions Units: mm

● Base-mounted SERVOPACKs

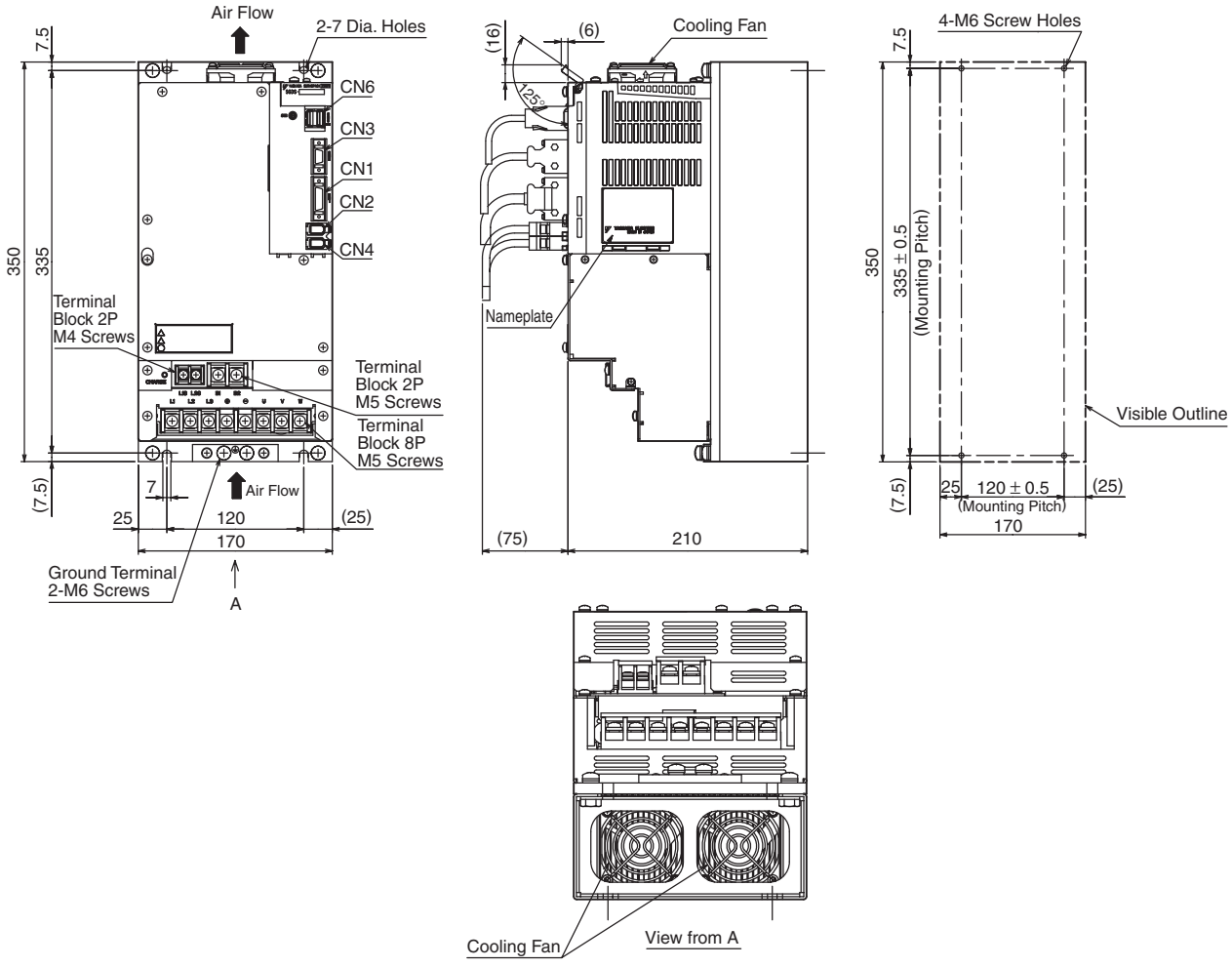
(7) Three-phase 200 V: 5.0 kW

Approx. Mass: 5.0 kg



(8) Three-phase 200 V: 7.5 kW

Approx. Mass: 10.5 kg



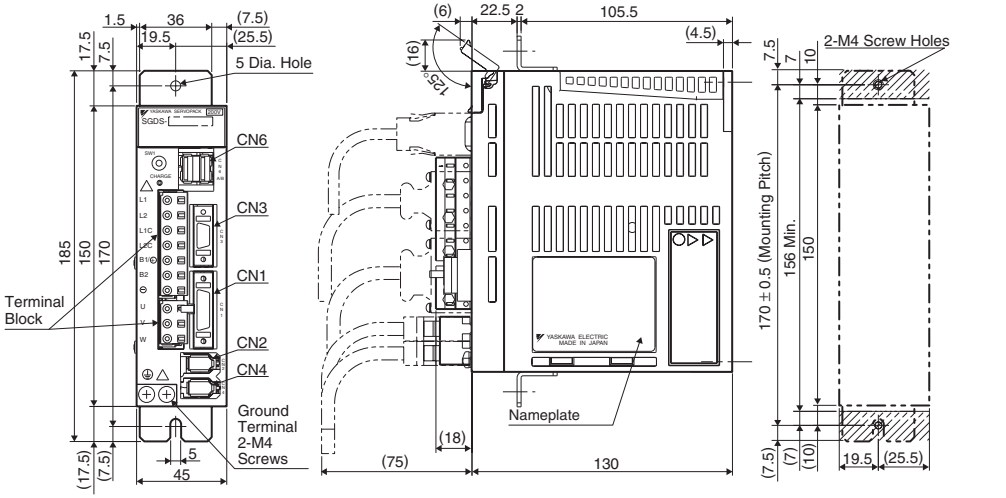
External Dimensions Units: mm

- Rack-mounted SERVOPACKs

(1) Single-phase 100/200 V: 50 W to 200 W

Approx. Mass: 0.7 kg

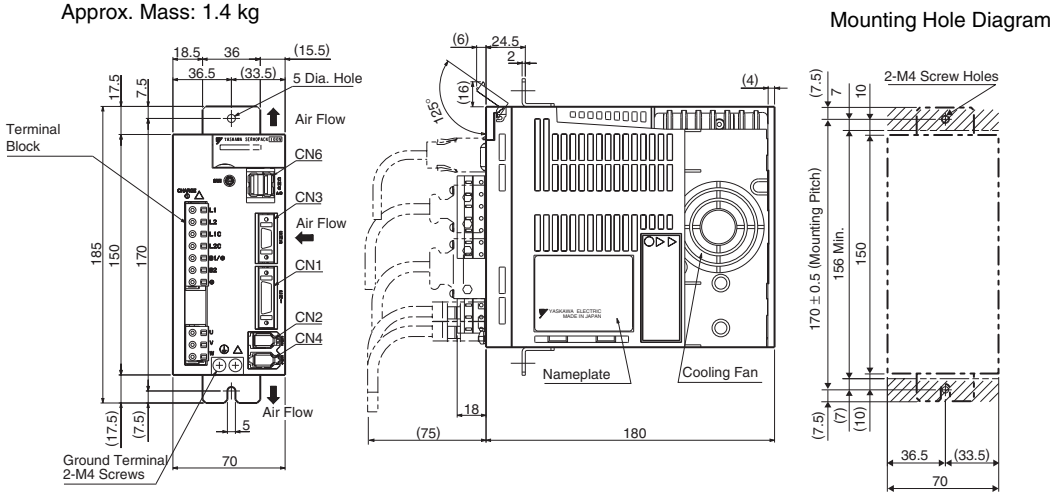
Mounting Hole Diagram



(2) Single-phase 100 V: 400 W

Approx. Mass: 1.4 kg

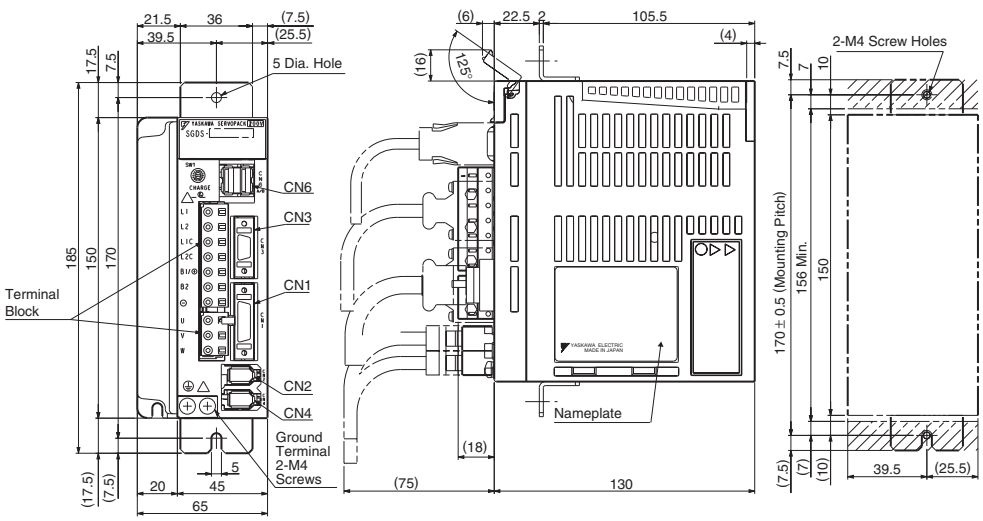
Mounting Hole Diagram



(3) Single-phase 200 V: 400 W

Approx. Mass: 0.9 kg

Mounting Hole Diagram



External Dimensions Units: mm

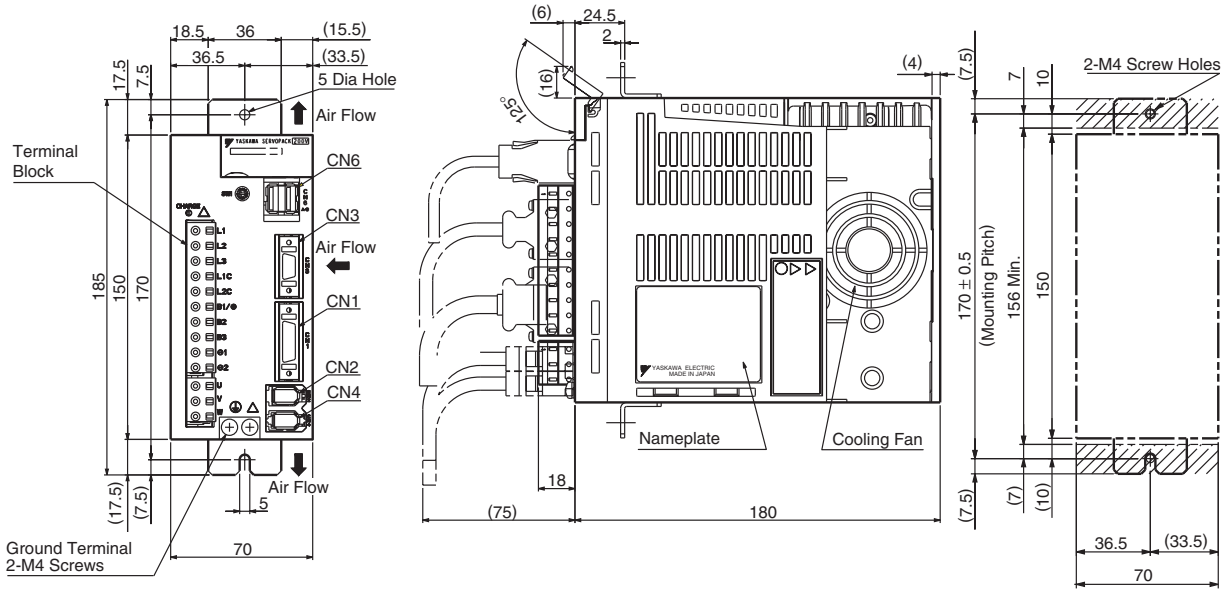
● Rack-mounted SERVOPACKs

(4) Single-phase 200 V: 750 W
Three-phase 200 V: 500 W, 1.0 kW

Note: Do not use the L3 terminal of the single-phase 200 V, 750 W SERVOPACK.

Approx. Mass: 0.7 kg

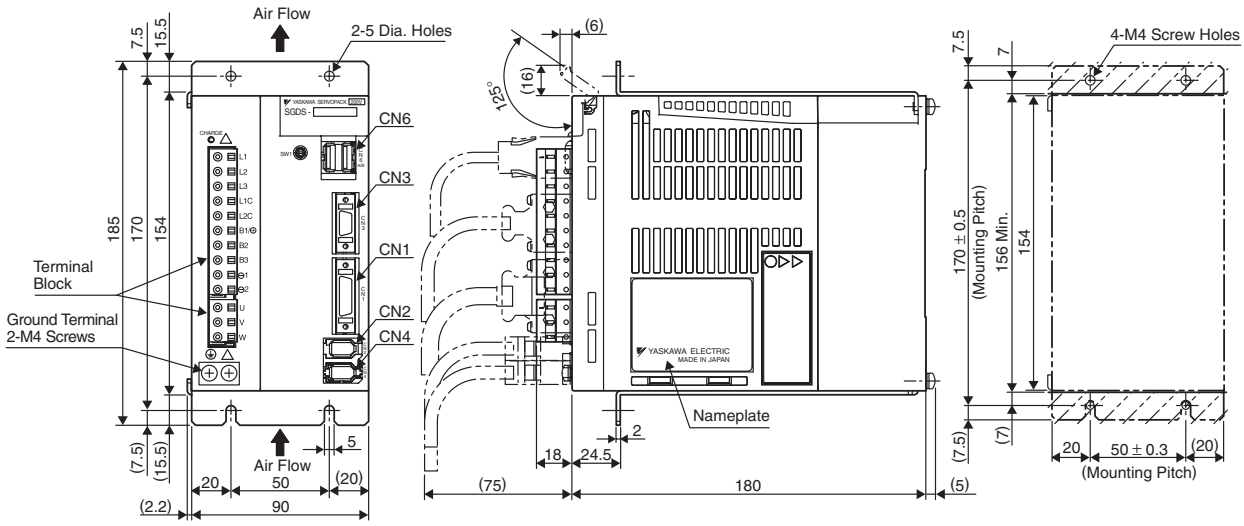
Mounting Hole Diagram



(5) Three-phase 200 V: 1.5 kW

Approx. Mass: 2.4 kg

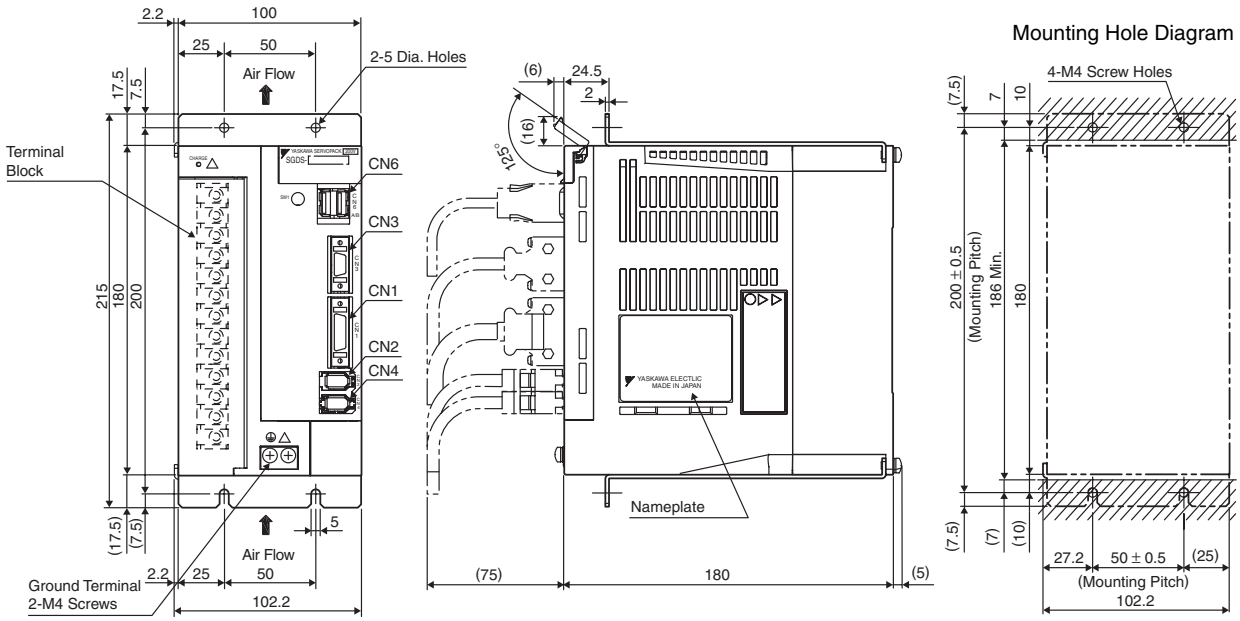
Mounting Hole Diagram



External Dimensions Units: mm

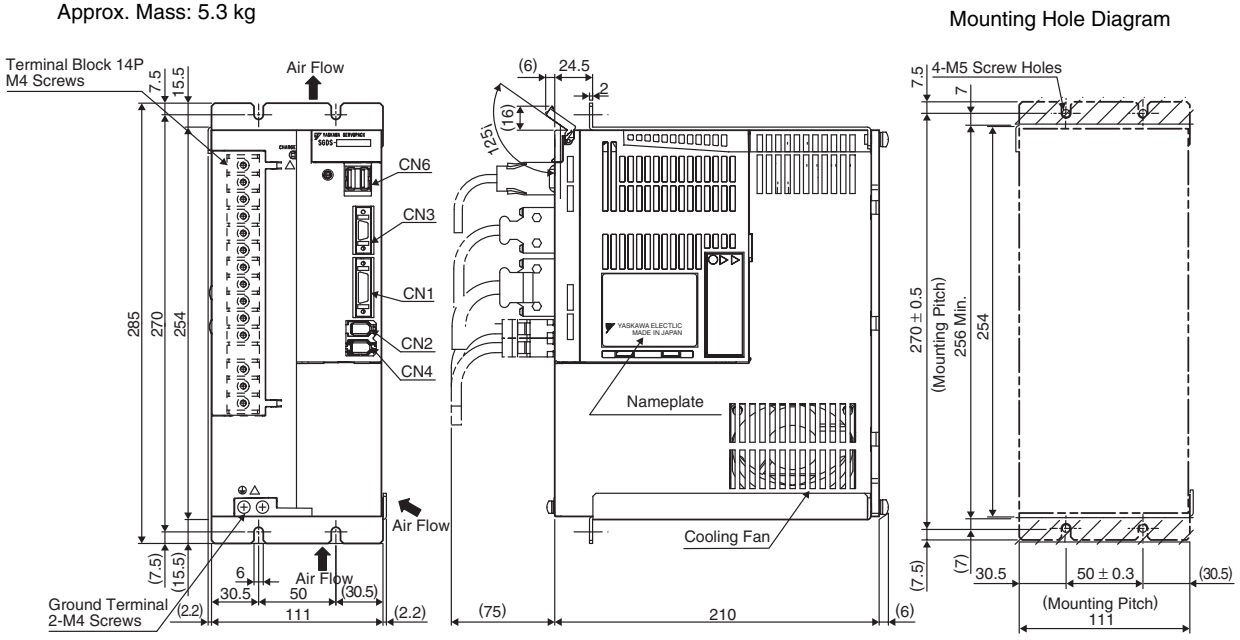
(6) Three-phase 200 V: 2.0 kW, 3.0 kW

Approx. Mass: 3.1 kg



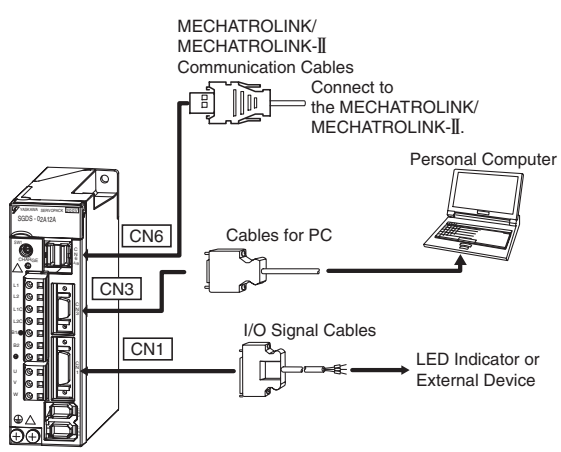
(7) Three-phase 200 V: 5.0 kW

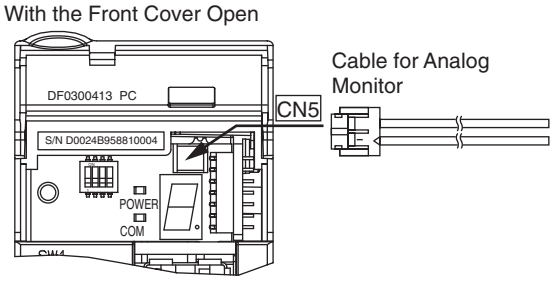
Approx. Mass: 5.3 kg

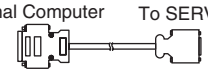
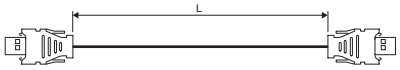
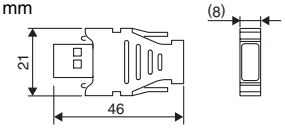


Selecting Cables Units: mm

- Cable Connections to CN1, CN3, CN5, and CN6





Name		Length	Order No.	Specifications	Details
To CN1 I/O Signal Cables	Connector Kit		JZSP-CSI9-2-E (DE9411354)	Soldered	(1)
	Connector		Connector: 10126-3000PE Case: 10326-52A0-008 (Sumitomo 3M Ltd.)		
	Connector Terminal Block Converter Unit		JUSP-TA26P-E	Terminal Block Converter Unit and 0.5 m Connection Cable 	(2)
To CN3 Cables for PC		2 m	JZSP-CMS02-E	D-Sub 9-pin (for DOS/V) To Personal Computer To SERVOPACK 	(3)
To CN6A and CN6B MECHATROLINK/ MECHATROLINK-Ⅱ Communication Cable	Cable with Connectors at Both Ends	0.5 m	JEPMC-W6002-A5-E		—
		1 m	JEPMC-W6002-01-E		
		3 m	JEPMC-W6002-03-E		
		5 m	JEPMC-W6002-05-E		
		10 m	JEPMC-W6002-10-E		
		20 m	JEPMC-W6002-20-E		
		30 m	JEPMC-W6002-30-E		
		40 m	JEPMC-W6002-40-E		
		50 m	JEPMC-W6002-50-E		
	Terminator		JEPMC-W6022-E	Units: mm 	
CN5 Cable for Analog Monitor		1 m	JZSP-CA01-E	To SERVOPACK 	(4)

Selecting Cables Units: mm

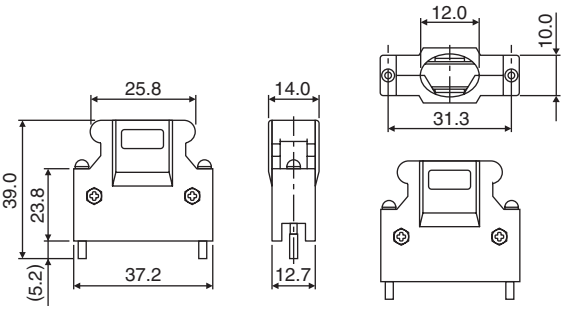
(1) Connector Kit (for CN1)

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

Connector Kit Model No.	Case		Connector	
	Model No.	Qty	Model No.	Qty
JZSP-CSI9-2-E (DE9411354)	10326-52A0-008*	1 set	10126-3000PE* (Soldered)	1

*: Manufactured by Sumitomo 3M Ltd.

・Dimensional Drawings of Case

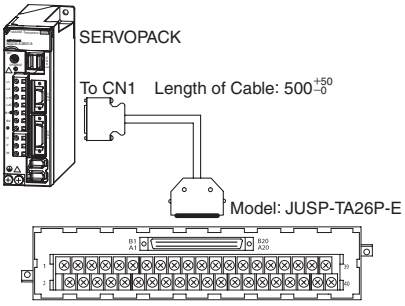


・Cable Size

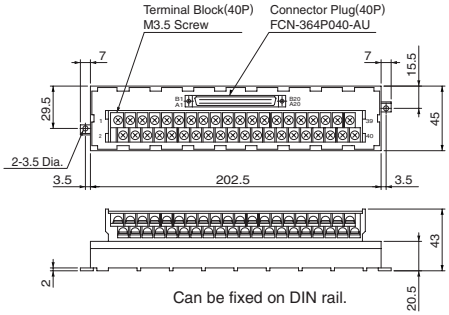
Item	Specifications
Cable	Use twisted-pair or twisted-pair shielded wire.
Applicable wires	AWG24, 26, 28, 30
Cable finished diameter	16 mm max.

(2) Connecter Terminal Block Converter Unit with a Cable (to CN1)

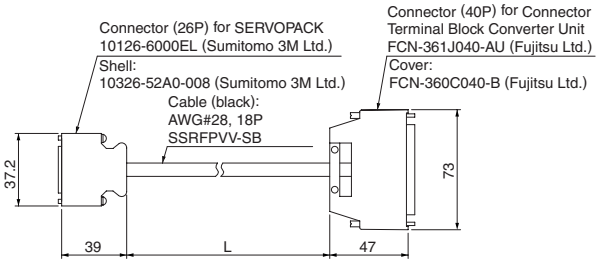
・Cable Connection



・Dimensional Drawings of Terminal Block

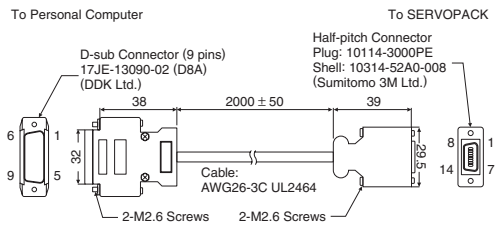


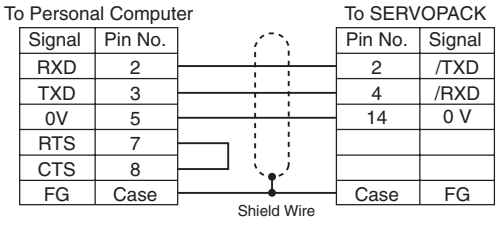
・Dimensional Drawings of Cable



Terminal Block Model	Length of Cable	Approx. Mass
JUSP-TA26P-E	0.5 m	100 g
JUSP-TA26P-1-E	1 m	200 g
JUSP-TA26P-2-E	2 m	400 g

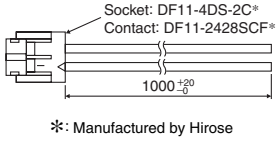
(3) Cable for DOS/V (to CN3)



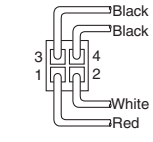


(4) Cable for Analog Monitor (to CN5)

・Dimensional Drawings



*: Manufactured by Hirose Electric Corporation.



View from Cable End

・Specifications

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

Note: The examples shown in the table are factory settings. To change the settings, use parameters Pn006 and Pn007.

● Main Circuit Cables

(1) Single-phase for 100 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-		
		A5F	01F	02F
Main Circuit Power Supply Input Terminals	L1, L2	HIV1.25		HIV2.0
Servomotor Connection Terminals	U, V, W	HIV1.25		
Control Power Supply Input Terminals	L1C, L2C	HIV1.25		
External Regenerative Resistor Connection Terminals	B1/⊕, B2	HIV1.25		
Ground Terminal	⏚	HIV2.0 min.		

(2) Single-phase for 200 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-				
		A5A	01A	02A	04A	08A
Main Circuit Power Supply Input Terminals	L1, L2	HIV1.25			HIV2.0	
Servomotor Connection Terminals	U, V, W	HIV1.25				
Control Power Supply Input Terminals	L1C, L2C	HIV1.25				
External Regenerative Resistor Connection Terminals	B1/⊕, B2	HIV1.25				
Ground Terminal	⏚	HIV2.0 min.				

(3) Three-phase for 200 V

External Terminal Name	Terminal Symbol	SERVOPACK Model SGDS-							
		05A	10A	15A	20A	30A	50A	60A	75A
Main Circuit Power Supply Input Terminals	L1, L2, L3	HIV2.0			HIV3.5		HIV5.5	HIV8.0	HIV14
Servomotor Connection Terminals	U, V, W	HIV2.0			HIV3.5	HIV5.5	HIV8.0	HIV14	
Control Power Supply Input Terminals	L1C, L2C	HIV1.25							
External Regenerative Resistor Connection Terminals	B1/⊕, B2*	HIV1.25			HIV2.0	HIV3.5	HIV5.5	HIV8.0	
Ground Terminal	⏚	HIV2.0 min.							

*:For SGDS-60 A and -75A SERVOPACK's, the external regenerative resistor connection terminals are B1 and B2.

The following table shows the wire size and allowable current for three cables. Use a cable whose specifications meet or are less than the values in the table.

・600 V Heat-resistant Vinyl Cables (HIV)

AWG Size	Nominal Cross Section Diameter mm²	Configuration Number of wires/mm²	Conductive Resistance Ω/km	Allowable Current at Surrounding Air Temperature (A)		
				30˚C	40˚C	50˚C
20	0.5	19/0.18	39.5	6.6	5.6	4.5
—	0.75	30/0.18	26.0	8.8	7.0	5.5
18	0.9	37/0.18	24.4	9.0	7.7	6.0
16	1.25	50/0.18	15.6	12.0	11.0	8.5
14	2.0	7/0.6	9.53	23	20	16
12	3.5	7/0.8	5.41	33	29	24
10	5.5	7/1.0	3.47	43	38	31
8	8.0	7/1.2	2.41	55	49	40
6	14.0	7/1.6	1.35	79	70	57

Note: The values in the table are only for reference.

IMPORTANT

1 Wire sizes were selected for three cables per bundle at 40˚C surrounding air temperature with the rated current.
2 Use cable with minimum withstand voltage of 600 V for main circuits.
3 If cables are bundled in PVC or metal ducts, consider the reduction ratio of the allowable current.
4 Use heat-resistant cables under high ambient or panel temperatures where normal vinyl cables will rapidly deteriorate.
5 Use cables within the allowable moment of inertia.
6 Do not use cables in continuous regenerating status.

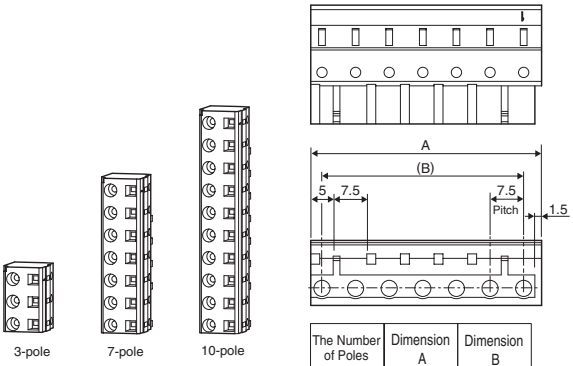
Selecting Cables Units: mm

● Connectors of Main Circuit and Control Power Supply Cables and Servomotor Cable (Standard: Spring Type)

・Connector Types

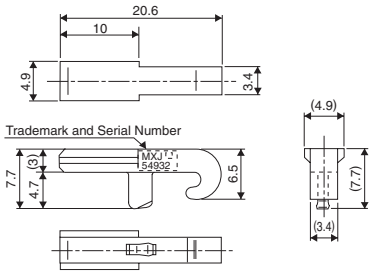
Appearance	Order No.	Manufacturer
3-pole (For servomotor main circuit cable connector to SERVOPACK)	51446-0301	Molex Japan Co., Ltd.
7-pole (For 50 W to 400 W SERVOPACKs)	51446-0701	
10-pole (For 0.5 kW to1.5 kW SERVOPACKs)	51446-1001	
Connection lever	54932-0000	

・External View and Dimensions



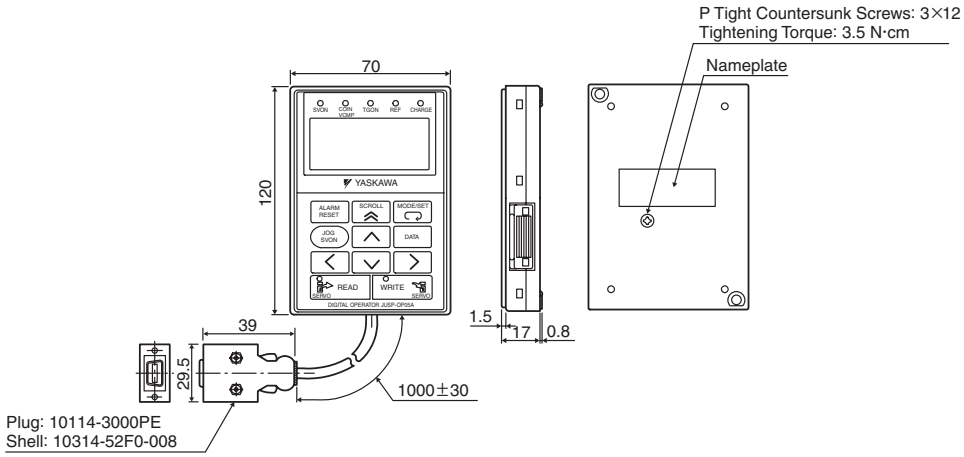
The Number of Poles	Dimension A	Dimension B
3	21.5	15
7	51.5	45
10	74	67.5

・Connection Lever



Selecting Peripheral Devices

● Digital Operator (Model: JUSP-OP05A)

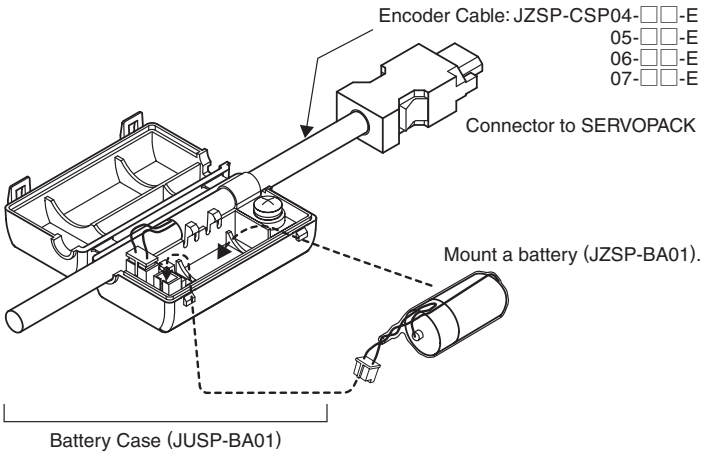


● Battery Case (Model: JUSP-BA01)

IMPORTANT

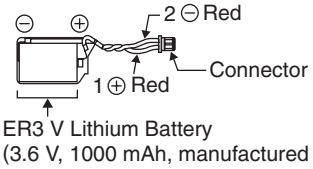
1 The battery case (JUSP-BA01) is not provided with a battery. A battery must be purchased separately.

2 Install the battery case where the surrounding air temperature is between 0℃ to 55℃.



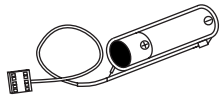
(1) Mounting a Battery in a Battery Case

Prepare a lithium battery (JZSP-BA01) and mount in a battery case.



(2) Connecting a Battery to the Host Controller

Use a battery that meets the specifications of the host controller. Use an ER6VC3N (3.6 V, 2000 mAh, manufactured by Toshiba Battery Co., Ltd.) or equivalent battery.



Selecting Peripheral Devices

● Molded-case Circuit Breaker and Fuse Capacity

Main Circuit Power Supply	SERVOPACK Model		Power Supply Capacity per SERVOPACK kVA	Current Capacity of Molded-case Circuit Breaker or Fuse *1, *2		Inrush Current	
	Capacity kW	SGDS-		Main Circuit Power Supply Arms	Control Circuit Power Supply Arms	Main Circuit Power Supply A	Control Circuit Power Supply A
Single-phase 100 V	0.03	A3B	0.25	4	0.26	14	30
	0.05	A5F					
	0.10	01F	0.40				
	0.20	02F	0.60	6			
	0.40	04F	1.2	12			
Single-phase 200 V	0.05	A5A	0.25	4	0.13	28	60
	0.10	01A	0.40				
	0.20	02A	0.75				
	0.40	04A	1.2	8			
	0.80	08A	2.2	16			
Three-phase 200 V	0.5	05A	1.4	4	0.15	28	60
	1.0	10A	2.3	7			
	1.5	15A	3.2	10			28
	2.0	20A	4.3	13			
	3.0	30A	5.9	17			
	5.0	50A	7.5	28		57	
	6.0	60A	12.5	32	0.27	94	
	7.5	75A	15.5	41			

*1: Nominal value at the rated load. The specified derating is required to select an appropriate fuse capacity.
*2: Cut-off characteristics (25℃): 200% for two seconds min. and 700% for 0.01 seconds min.
Note: Do not use a fast-acting fuse. Because the SERVOPOACK's power supply is a capacitor input type, a fast-acting fuse may blow when the power is turned on.

If selecting a molded-case circuit breaker, observe the following precautions.

IMPORTANT

■Ground Fault Detector
- Select ground fault detectors for inverters.
- High-frequency current leaks from the servomotor armature because of switching operation inside the SERVOPACK.

(1) Maximum Input Current

- The instantaneous maximum output of the SERVOPACK is approximately 3 times the rated output for a maximum of 3 seconds. Accordingly, select a molded-case circuit breaker whose breaking time is 5 seconds or more at 300% of SERVOPACK rated current. The general-purpose low-speed acting molded-case circuit breakers are applicable.
- The power supply capacity per SERVOPACK when using a servomotor is described in the table above. Select a molded-case circuit breaker with the capacity larger than the effective load current (when using multiple SERVOPACKs) calculated from the total power supply capacity .
- The consumption of other controllers must be considered when selecting a molded-case circuit breaker.

(2) Inrush Current

- Refer to the table above for SERVOPACK inrush current.
- The allowable inrush current for a low-speed acting molded-case circuit breaker is approximately 10 times the rated current for 0.02 seconds.
- When turning on multiple SERVOPACKs simultaneously, select a molded-case circuit breaker with the allowable current for 20 ms larger than the total inrush current shown in the table above.

Selecting Peripheral Devices

● Noise Filters, Magnetic Contactors, Surge Absorbers, and AC/DC Reactors

Main Circuit Power Supply	SERVOPACK Model		Recommended Noise Filter		Magnetic Contactor	Surge Absorber	AC/DC Reactor
	Capacity kW	SGDS-	Model No.	Specifications			
Single-phase 100 V	0.03	A3B	FN2070-6/07	Single-phase 250 VAC, 6 A	SC-03	R·C·M -601BQZ-4	X5052
	0.05	A5F					X5053
	0.10	01F					
	0.20	02F	FN2070-10/07	Single-phase 250 VAC, 10 A			X5054
	0.40	04F	FN2070-16/07	Single-phase 250 VAC, 16A	SC-4-1		X5056
Single-phase 200 V	0.05	A5A	FN2070-6/07	Single-phase 250 VAC, 6 A	SC-03		X5052
	0.10	01A					
	0.20	02A					X5053
	0.40	04A	FN2070-10/07	Single-phase 250 VAC, 10 A			X5054
	0.80	08A	FN2070-16/07	Single-phase 250 VAC, 16 A	SC-4-1		X5056
Three-phase 200 V	0.5	05A	FN258L-7/07	Three-phase 480 VAC, 7 A	SC-03	R·C·M -601BUZ-4	X5061
	1.0	10A	FN258L-16/07	Three-phase 480 VAC, 16 A	SC-4-1		
	1.5	15A					X5060
	2.0	20A			SC-5-1		
	3.0	30A	FN258L-30/07	Three-phase 480 VAC, 30 A			X5059
	5.0	50A	FMAC-0934-5010	Three-phase 480 VAC, 50 A	SC-N1		X5068
	6.0	60A		Three-phase 440 VAC, 50 A			—
	7.5	75A	FMAC-0953-6410	Three-phase 440 VAC, 64 A	SC-N2		—
Details			(1)		(2)	(3)	(4)

Notes: 1 If some SERVOPACKs are wired at the same time, select the proper magnetic contactors accroding to the total capacity.
2 The following table shows the manufacturers of each device.

Peripheral Device	Manufacturer
Noise Filter	FN type: Schaffner EMC. Inc.
	FMAC type: Schurter Inc. (formerly Timonta)
Magnetic Contactor	Fuji Electric FA Components & Systems Co., Ltd.
Surge Absorber	Okaya Electric Industries Co., Ltd. (Surge Protector)
AC/DC Reactor	Yaskawa Controls Co., Ltd.

IMPORTANT

■Noise Filter for Brake Power Supply

Use the following noise filter at the brake power input for 400 W or less servomotors with holding brakes.

Model No.: FN2070-6/07 (manufactured by Schaffner EMC. Inc.)

Selecting Peripheral Devices

● Regenerative Resistors and Brake Power Supply Units

Main Circuit Power Supply	SERVOPACK Model		Regenerative Resistor			Brake Power Supply Unit
	Capacity kW	SGDS-	Built-in		Externally Connected	
			Resistance Ω	Capacity W		
Single-phase 100 V	0.03	A3B	None	None	—	For 24-VDC brakes*3 To be provided by the customer.
	0.05	A5F				For 24-VDC brakes*3 To be provided by the customer.
	0.10	01F				
	0.20	02F				
	0.40	04F				
Single-phase 200 V	0.05	A5A	None	None	—	For 90-VDC brakes • LPDE-1H01-E for 100 VAC input • LPSE-2H01-E for 200 VAC input
	0.10	01A				
	0.20	02A				
	0.40	04A				
	0.80	08A	50	60		
Three-phase 200 V	0.45	05A	50	40	—	
	1.0	10A		60		
	1.5	15A	20	50		
	2.0	20A	12	80		
	3.0	30A				
	5.0	50A	8	180	—	
	6.0	60A	(6.25)*1	(880)*1	JUSP-RA04	
	7.5	75A	(3.13)*2	(1760)*2	JUSP-RA05	
Details			(5)			(6)

*1: For the optional JUSP-RA04 Regenerative Resistor Unit.
*2: For the optional JUSP-RA05 Regenerative Resistor Unit.
*3: If using a commercially available power supply for the 24-VDC brake, install a surge suppressor to protect the power supply from overvoltage. If a surge suppressor is not used, the power supply may be damaged if an overvoltage, such as a surge, occurs in the output section.

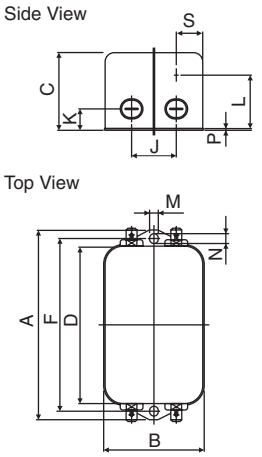
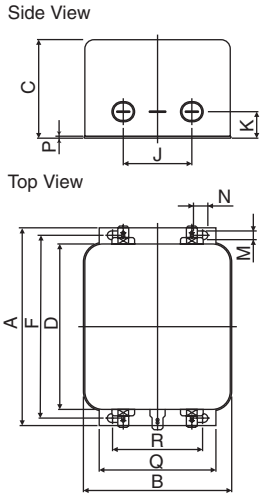
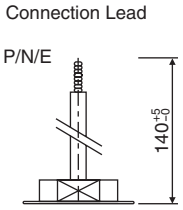
Notes: 1 If the SERVOPACK cannot process the regenerative power, an external regenerative resistor is required. External regenerative resistors are required for SERVOPACKs with a capacity of 6.0 kW or more as a standard safety measure.
2 The following table shows the manufacturers of each device.

Peripheral Device	Manufacturer
External Regenerative Resistor	Iwaki Musen Kenkyusho Co., Ltd.
External Regenerative Unit	Yaskawa Electric Corporation
Brake Power Supply Unit	Yaskawa Controls Co., Ltd.

(1) Noise Filter

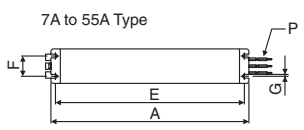
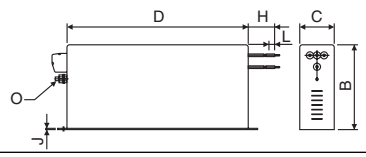
The recommended noise filter is manufactured by Schaffner EMC. Inc. (FN type) and Schurter Inc. (formerly Timonta) (FMAC type).

・FN Type for Single-phase 100/200 V

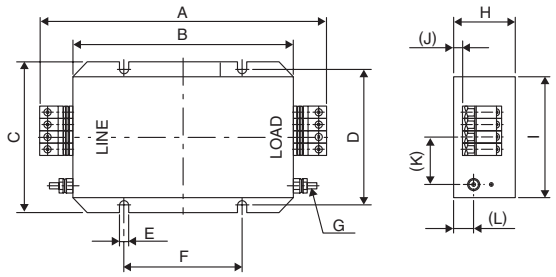
Model No.		FN2070-6/07	FN2070-10/07	FN2070-16/07
Dimensional Drawings				
				
External Dimensions	Symbol	Dimensions in mm		
	A	113.5±1	156±1	119±0.5
	B	57.5±1		85.5±1
	C	45.4±1.2		57.6±1
	D	94±1	130.5±1	98.5±1
	F	103±0.3	143±0.3	109±0.3
	J	25±0.2		40±0.2
	K	8.4±0.5		8.6±0.5
	L	32.4±0.5		—
	M	4.4±0.1	5.3±0.1	4.4±0.1
	N	6±0.1		7.4±0.1
	P	0.9±0.1		1.2±0.1
	Q	—		66±0.3
	R	—		51±0.2
	S	38±0.5		—
Specifications		250 VAC, 6 A	250 VAC, 10 A	250 VAC, 16 A
Applicable SERVOPACK SGDS-	Single-phase 100 V	A5F	02F	04F
		01F		
	Single-phase 200 V	A5A	04A	08A
		01A		
		02A		
Manufacturer		Schaffner EMC. Inc.		

Selecting Peripheral Devices

- FN Type for Three-phase 200 V

Model No.		FN258L-7/07	FN258L-16/07	FN258L-30/07
Dimensional Drawings		Side View 7A to 55A Type  Front and Side View 		
External Dimensions	Symbol	Dimensions in mm		
	A	225±1	305±1	335±1
	B	126±0.8	142±0.8	150±1
	C	50±0.6	55±0.6	60±0.6
	D	225±0.8	275±0.8	305±1
	E	240±0.5	290±0.5	320±0.5
	F	25±0.3	30±0.3	35±0.3
	G	6.5±0.2		
	H	300±10		400±10
	J	1±0.1		
	L	9±1		
	O	M5		
	P	AWG16	AWG14	AWG10
Specifications		480 VAC, 7 A	480 VAC, 16 A	480 VAC, 30 A
Applicable SERVOPACK SGDS-	Three-phase 200 V	05A	10A, 15A, 20A	30A
Manufacturer		Schaffner EMC. Inc.		

- FMAC Type for Three-phase 200 V

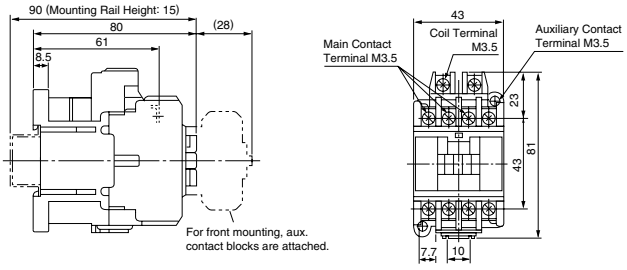
Model No.		FMAC-0934-5010	FMAC-0953-6410
Dimensional Drawings			
External Dimensions	Symbol	Dimensions in mm	
	A	251	308
	B	201	231
	C	151	151
	D	135^{+0}_{-1}	135^{+0}_{-1}
	E	6.5±0.3	6.5±0.3
	F	115±0.3	115±0.3
	G	M6	M6
	H	66	66
	I	121	121
	J	(10)	(13)
	K	(41)	(45)
	L	(17)	(34)
Specifications		440 VAC, 50 A	440 VAC, 64 A
Applicable SERVOPACK SGDS-	Three-Phase 200 V	50A 60A	75A
Manufacturer		Schurter Inc. (formerly Timonta)	

(2) Magnetic Contactor

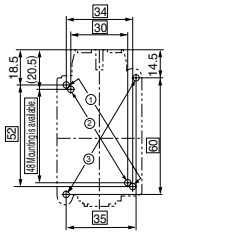
A magnetic contactor is required to externally activate the AC power for the SERVOPACK.
Be sure to attach a surge absorber to the excitation coil of the magnetic contactor.

- Model: SC-03

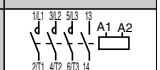
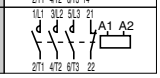
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.32 kg

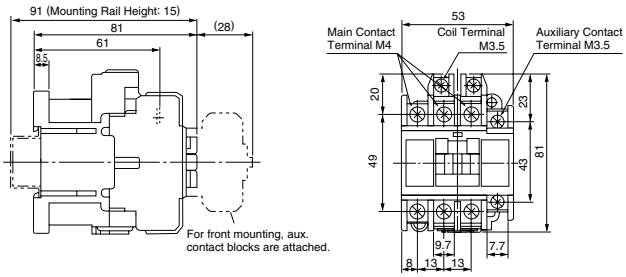


●Mounting methods: The following methods ①, ②, ③ are available.
①··· 34 × (48 to) 52
②··· 30 × 48
③··· 35 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

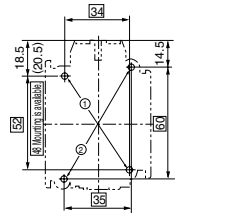
Auxiliary Contact	Structure
1a	
1b	

- Model: SC-4-1

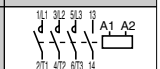
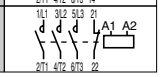
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.36 kg

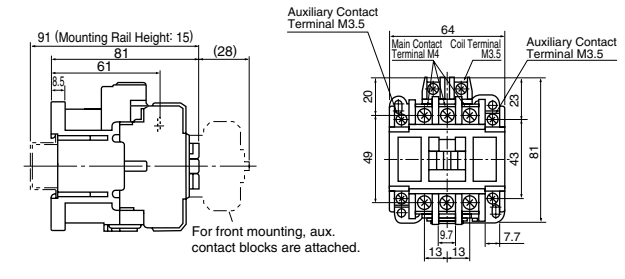


●Mounting methods: The following methods ①, ② are available.
①··· 34 × (48 to) 52
②··· 35 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

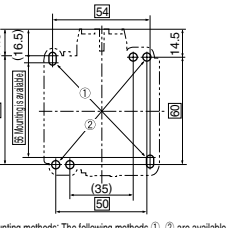
Auxiliary Contact	Structure
1a	
1b	

- Model: SC-5-1

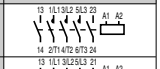
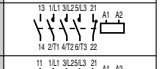
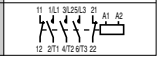
External Dimensions	Mounting Hole Dimensions	Terminal Symbols



Approx. Mass: 0.38 kg

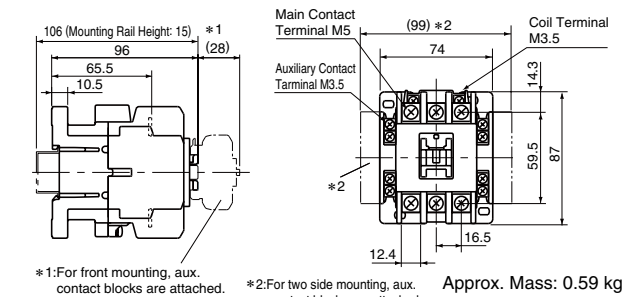


●Mounting methods: The following methods ①, ② are available.
①··· 54 × (56 to) 60
②··· 50 × 60
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

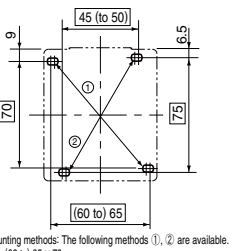
Auxiliary Contact	Structure
2a	
1a1b	
2b	

- Model: SC-N1, SC-N2

External Dimensions	Mounting Hole Dimensions	Terminal Symbols

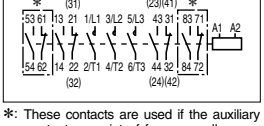


Approx. Mass: 0.59 kg



●Mounting methods: The following methods ①, ② are available.
①··· (60 to) 65 × 70
②··· 45 (to 50) × 75
●Mounting screw: 2-M4
Use the two mounting holes on the diagonal line to mount a contactor.

Structure



∗: These contacts are used if the auxiliary contacts consist of four normally open (NO) and four normally close (NC) contacts.
Note: The terminals of the auxiliary contacts are numbered differently than conventional terminals. The numbers in parentheses use the conventional method.

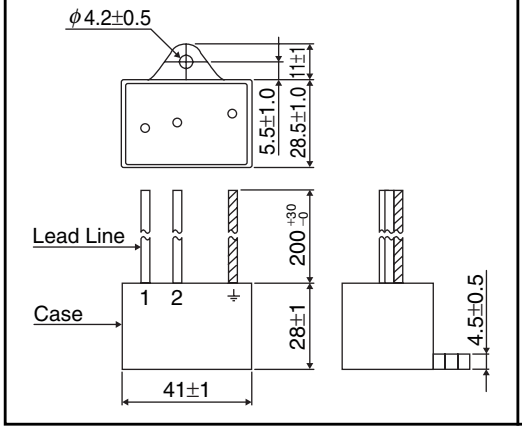
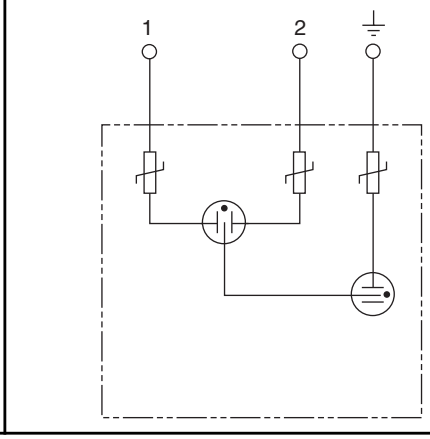
Selecting Peripheral Devices

Units: mm

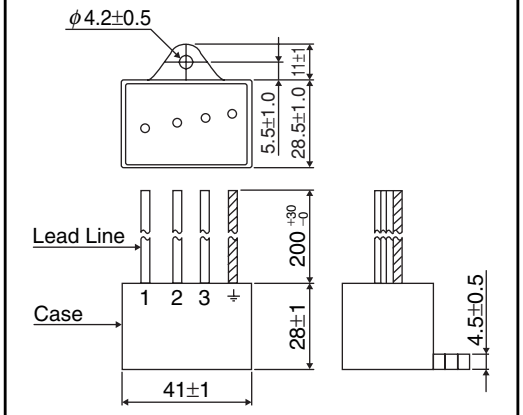
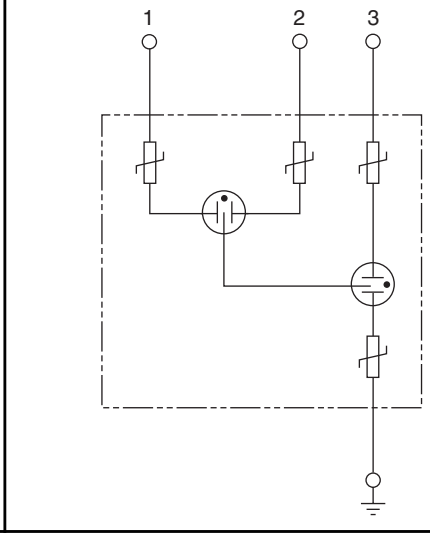
(3) Surge Absorber

The surge absorber absorbs switching surge and prevents faulty operation in or damage to electronic circuits. Recommended surge absorbers (for lightning surge) are listed below.

・Model: R・C・M-601BQZ-4

Dimensional Drawings	Internal Connection Diagram
	

・Model: R・C・M-601BUZ-4

Dimensional Drawings	Internal Connection Diagram
	

(4) AC/DC Reactors for Power Supply Harmonic Suppression

Manufactured by Yaskawa Controls Co., Ltd. Contact your Yaskawa representative for details.

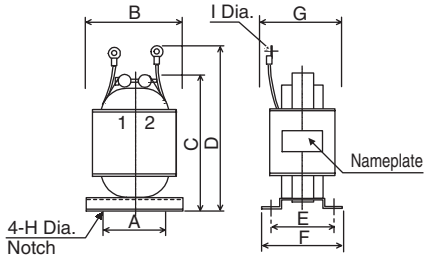
If the power supply harmonic suppression is needed, connect an AC reactor to the AC line for the single-phase input, or connect a DC reactor between the SERVOPACK main circuit terminals ⊖1 and ⊖2 for the three-phase input.

Select a reactor that matches the ratings of the SERVOPACK.

・Specifications

Applicable SERVOPACK Model SGDS-		AC/DC Reactor Model	Reactor Specifications	
			Inductance mH	Rated Current A
Single-phase 100 V	A3B	X5052	45.0	1.0
	A5F	X5053	20.0	2.0
	01F			
	02F	X5054	5.0	3.0
	04F	X5056	2.0	5.0
Single-phase 200 V	A5A	X5052	45.0	1.0
	01A			
	02A	X5053	20.0	2.0
	04A	X5054	5.0	3.0
	08A	X5056	2.0	5.0
Three-phase 200 V	05A	X5061	2.0	4.8
	10A			
	15A	X5060	1.5	8.8
	20A			
	30A	X5059	1.0	14.0
	50A	X5068	0.47	26.8
	60A	—	—	—
	75A			

・Dimensional Drawings



Reactor Model	Dimensions in mm									Approx. Mass kg
	A	B	C	D	E	F	G	H	I	
X5052	35	52	80	95	30	40	45	4	4.3	0.4
X5053	35	52	90	105	35	45	50	4	4.3	0.6
X5054	35	52	80	95	30	40	45	4	4.5	0.4
X5056	35	52	80	95	30	40	45	4	4.3	0.4
X5059	50	74	125	140	35	45	60	5	5.3	1.1
X5060	40	59	105	125	45	60	65	4	4.3	1.0
X5061	35	52	80	95	35	45	50	4	4.3	0.5
X5068	50	74	125	155	53	66	75	5	6.4	1.9

Selecting Peripheral Devices

(5) External Regenerative Resistor

When regenerative energy is so large that a SERVOPACK cannot process, install externally a regenerative resistor. The regenerative resistor must be provided by the customers. Refer to the table below for selecting the regenerative resistor.

SERVOPACK Capacity	Necessity of External Regenerative Resistors	Descriptions
400 W or less	Not Required	No built-in regenerative resistor is provided, however, normally an external regenerative resistor is not required. Install external regenerative resistors when the smoothing capacitor in SERVOPACK cannot process all the regenerative power.
0.5 kW to 5.0 kW	Not Required	A built-in regenerative resistor is provided as standard. Install external regenerative resistors when the built-in regenerative resistor cannot process all the regenerative power.
6.0 kW to 7.5 kW	Required	No built-in regenerative resistor is provided, so the external regenerative resistor is required. If the external regenerative resistor is not connected with the SERVOPACK, the alarm A.300 is detected as a regeneration error alarm.

①Example: External Regenerative Resistor (by Iwaki Musen Kenkyusho. Co., Ltd.)

Regenerative Resistor Model	Specifications
RH120	70 W, 1 to 100Ω
RH150	90 W, 1 to 100Ω
RH220	120 W, 1 to 100Ω
RH330C	200 W, 1 to 10kΩ
RH500	300 W, 1 to 30Ω

・Specifications

Resistance Tolerance	K: ±10%, J: ±5%, H: ±3%
Temperature Resistance Characteristics	±400 PPM/℃ (20Ω max.), ±260 PPM/℃ (20Ω min.)
Withstand Voltage	2000 VAC/min. △R: ±(0.1% + 0.05Ω)
Insulation Resistance	500 VDC, 20 MΩ min.
Short-time Overload	When 10 times the rated power is applied for five seconds, △R: ±(2% + 0.05Ω)
Life	1000 hours of repeating the operation ON for 90 minutes and OFF for 30 minutes, △R: ±(5% + 0.05Ω)
Heat Resistance	Not ignite after having applied 10 times the rated electric power for one minute
Operating Temperature	−25˚C to 150˚C

・Model Designation

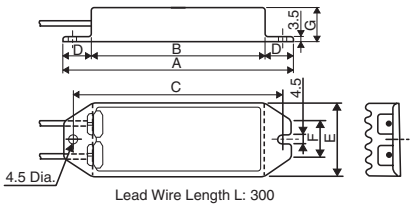
RH120 (N) 10Ω J

- Model: N: Noninductive Winding
- Resistance
- Resistance Tolerance

Code	Specifications
K	±10%
J	±5%
H	±3%

・External Dimensions

RH120, 150, 220

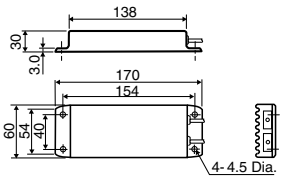


Lead Wire Length L: 300

Model	Rated Power	Resistance
RH120	70 W	1Ω to 100Ω
RH150	90 W	1Ω to 100Ω
RH220	120 W	1Ω to 100Ω

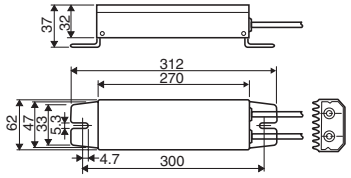
Model	A	B	C	D	E	F	G
RH120	182	150	172	16	42	22	20
RH150	212	180	202	16	44	24	30
RH220	230	200	220	15	60	24	20

RH220B



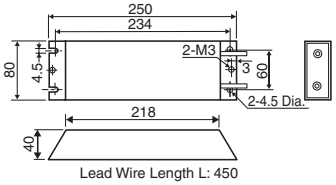
Lead Wire Length L: 500
Rated Power: 120 W
Resistance: 1Ω to 100Ω

RH300C



Lead Wire Length L: 300
Rated Power: 200 W
Resistance: 1Ω to 10 kΩ

RH500



Lead Wire Length L: 450
Rated Power: 300 W
Resistance: 1Ω to 30Ω

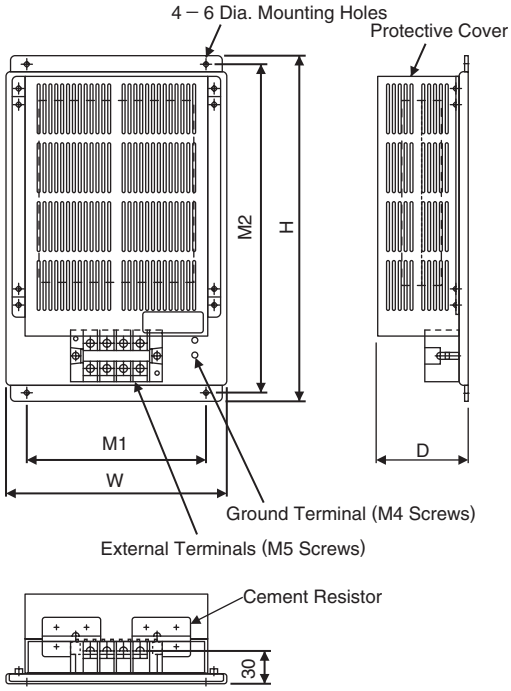
(5) External Regenerative Resistor

② Regenerative Resistor

The SERVOPACKs with a capacity of 6.0 kW or more do not have a built-in regenerative resistor.
The following regenerative resistor unit is required according to the SERVOPACK model.

SERVOPACK Model	Regenerative Resistor Unit Model	Specifications	Allowable Power Loss
SGDS-60A	JUSP-RA04	6.25Ω, 880 W	180 W
SGDS-75A	JUSP-RA05	3.13Ω, 1760 W	350 W

・External Dimensions



Model	W	H	D	M1	M2	Approx. Mass
JUSP-RA04	220	350	92	180	335	4 kg
JUSP-RA05	300	350	95	250	335	7 kg

(6) Brake Power Supply Unit

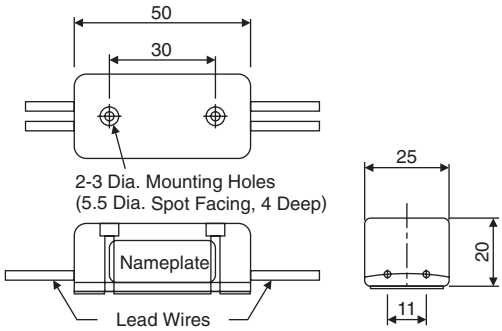
200 V input: LPSE-2H01-E
100 V input: LPDE-1H01-E

・Specifications

Rated output voltage: 90 VDC
Maximum output current: 1.0 A DC
Lead wire length: 500 mm each
Maximum surrounding air temperature: 60℃
Lead wires: Color coded. Refer to the table below.

To AC Input		To Brake
100 V	200 V	
Blue / White	Yellow / White	Red / Black

・External Dimensions

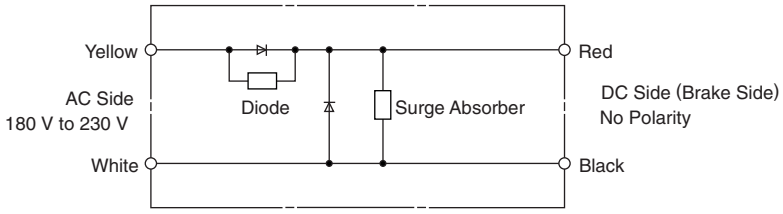


Selecting Peripheral Devices Units: mm

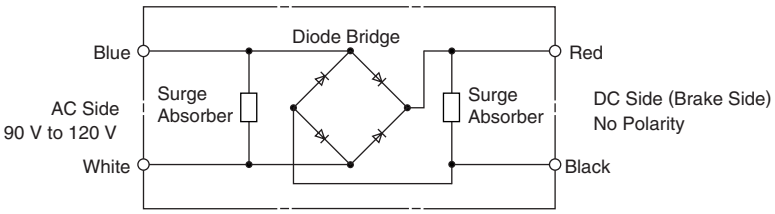
・Internal Circuits

Open or close the circuit for the brake power supply on the AC side of the brake power suppy unit.
When switching on the DC side, install a surge absorber near the brake coil to prevent damage to the brake coil from voltage surges due to DC-side switching.

Internal Circuit for 200 VAC
Brake Power Supply Model: LPSE-2H01-E



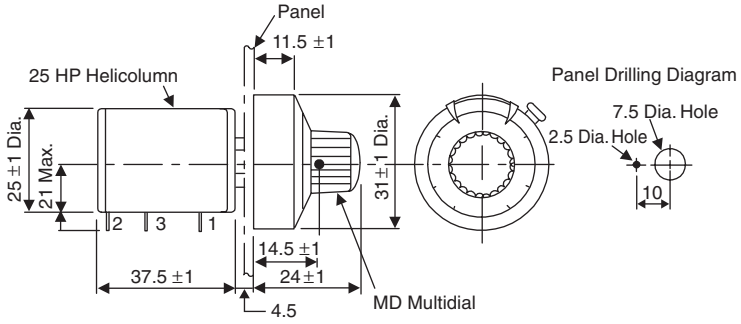
Internal Circuit for 100 VAC
Brake Power Supply Model: LPDE-1H01-E



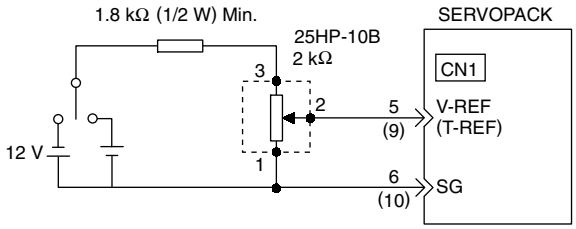
● Variable Resistor for Speed and Torque Setting (Model: 25HP-10B)

The multi-turn type winding variable resistors with dial MD10-30B4 are manufactured by Sakae Tsushin Kogyo Co., Ltd.

・External Dimensions



・Connection Example to an External Power Supply



Σ-Ⅲ SERIES PRODUCT CATALOG

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