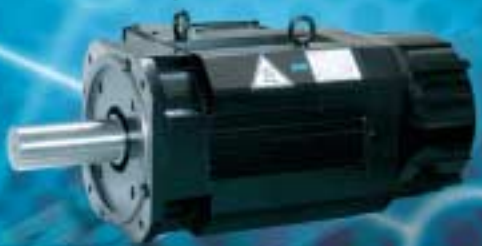
YASKAWA

AC SERVO DRIVES
LARGE-CAPACITY Σ-Ⅱ SERIES

200 V CLASS 22 kW TO 37 kW
400 V CLASS 22 kW TO 75 kW
SERVOMOTOR: SGMVH
SERVOPACK: SGDH

Always evolving — Large-capacity Σ-Ⅱ



Certified for ISO9001 and ISO14001

JQA-0422

JQA-EM0202
JQA-EM0924

The New, Large-capacity Σ-Ⅱ Drives,

Providing Comprehensive Support for Heavy-Duty Machinery

Superior performance, super compact size, ease of use and stellar reputation for boosting efficiency by reducing power consumption have always made the large-capacity Σ-Ⅱ drives the favorite choice for heavy-duty applications. The new line of servomotors now packs even more performance into smaller packages than ever. Look to the large-capacity Σ-Ⅱ to achieve new levels of performance with your heavy-duty machinery!

Applications

Machine Tools
Helps meet speed and capacity demands of feed and spindle motors in high-speed, heavy-duty machining applications.

Rotary Cutters
Outstanding acceleration/deceleration torque for high-speed tracking.

LCD Panel Manufacturing Systems (photoresist spin coaters)
Large-capacity servomotors deliver the acceleration/deceleration torque needed for high-precision, quick-settling speed control, spinning glass substrates for up to thousands of revolutions per minute.

Transfer Presses
The large-capacity Σ-Ⅱ servo drives bring new levels of performance to today's large, high-speed machinery, quieter than ever with digital technology.

Chip Mounters
Try the large-capacity Σ-Ⅱ for main spindle motors in advanced, high-speed systems, to achieve higher throughput.

Servo Presses and Injection Molding Systems
To attain cleaner and more efficient operation, presses are evolving from hydraulic to electric. The new large-capacity SGMVH servomotor improves the performance of the previous generation Σ-Ⅱ with extensive install base, delivering further improvements in productivity.

Features

Compact, low-inertia servomotors
The new SGMVH models provide the ultimate combination in compactness and low inertia with rated outputs from 22 to 75 kW and at rated speeds of 1500/800 min^{-1}.

- Compared with SGMBH servomotors:
  Moment of Inertia : 75 to 50%
  Mass : 60 to 80%

High-precision, high-efficiency SERVOPACKs
Our d-q conversion current control scheme improves torque control precision (repeatability) from ±5% to ±2%. High-speed CPU processing and expanded control algorithms deliver extremely fast response to minimize tact time.

Simple implementation
The automatic motor identification function sets motor parameters for you, simplifying setup, and the following modules can be instantly connected to the SERVOPACK for quick network support (excluding 75 kW models).

- MECHATROLINK-Ⅱ : JUSP-NS115 Module
- DeviceNet : JUSP-NS300 Module
- PROFIBUS-DP : JUSP-NS500 Module

Easy maintenance
Just connect to a PC for simple parameter definition/change/backup, trace functions and other tools to make motor adjustment simpler than ever. If an alarm is generated, only the main circuit power supply is cut. The monitor function makes it possible to diagnose faults and identify causes quickly for minimum downtime.

Model Classification and Type Designation

Model Classification

The following table lists the product range of large-capacity Σ-Ⅱ servomotors.

Rated Speed min^{-1}	Rated Output kW	Voltage		Mounting		Other Specifications		
		200 V	400 V	Flange-mounted type	Foot-mounted type	Oil seal, Dust seal*	With brakes	
							Flange-mounted type	Foot-mounted type
1500	22	○	△	○	△	○	△	△
	30	○	△	○	△	○	△	△
	37	○	△	○	△	○	△	△
	45	—	○	○	△	○	△	△
	55	—	○	○	△	○	—	△
	75	—	○	○	△	○	—	△
800	22	△	△	△	△	△	△	△
	30	△	△	△	△	△	—	△
	37	△	△	△	△	△	—	△
	45	—	△	△	△	△	—	—

○ : Standard △ : Semi-standard — : None

*: Servomotors with oil seals are available with flange mounting only.

Type Designation

●SGMVH Servomotor

S G M V H - 2 B A 2 B 2 N

Σ-Ⅱ Series
Type: SGMVH

Motor Output
2B : 22 kW 4E : 45 kW
3Z : 30 kW 5E : 55 kW
3G : 37 kW 7E : 75 kW

Voltage
A : 200 V
D : 400 V

Encoder Specifications
2 : 17-bit serial absolute (standard)
C : 17-bit serial incremental (standard)
3 : 20-bit serial absolute (optional)

Rated Motor Speed
B : 1500 min^{-1} (standard)
D : 800 min^{-1} (semi-standard)

Motor Specifications
2 : Flange mounted, straight shaft (with key and no tap)
6 : Flange mounted, straight shaft (with key and tap)
K : Foot mounted, straight shaft (with key and no tap)
L : Foot mounted, straight shaft (with key and tap)

Other Specifications
N : Standard (no other specification)
1 : Dust seal
S : Oil seal
B : Holding brake (90 VDC)
C : Holding brake (24 VDC)
D : Oil seal and holding brake (90 VDC)
E : Oil seal and holding brake (24 VDC)
F : Dust seal and holding brake (90 VDC)
G : Dust seal and holding brake (24 VDC)

●SGDH SERVOPACK

S G D H - 2 B D E B

Σ-Ⅱ Series
Type: SGDH

Motor Output
2B : 22 kW 4E : 45 kW (400 V only)
3Z : 30 kW 5E : 55 kW (400 V only)
3G : 37 kW 9Z : 75 kW (400 V only)

Voltage
A : 200 V
D : 400 V

Model
E : Torque/Speed/Position Control

Design Revision
(Only SGDH SERVOPACKs with design revision number B or later can be used with SGMVH servomotors.)

●Digital Operator

J U S P - O P 0 2 A - 2

For SERVOPACK

Digital Operator

Application
02 : Hand-held type
(connected by specialized 1 m cable)

Version

Applicable SERVOPACK Type
2 : SGDH

1500 min^{-1} Series — Ratings and Specifications

Time Rating : Continuous
Vibration Class : V15
Ambient Temperature : 0 to 40℃

Excitation : Permanent magnet
Mounting : Flange mounted (standard)
Foot mounted (semi-standard)

Thermal Class : F
Enclosure : Totally enclosed, cooled separately, IP44
Ambient Humidity : 20% to 80% (no condensation)

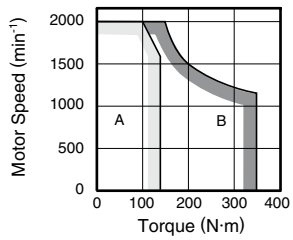
Voltage Class		200 V			400 V					
Servomotor Model	SGMVH-	2BA□B	3ZA□B	3GA□B	2BD□B	3ZD□B	3GD□B	4ED□B	5ED□B	7ED□B
Rated Output*	kW	22	30	37	22	30	37	45	55	75
Rated Torque*	N·m	140	191	236	140	191	236	286	350	477
Stalling Torque*	N·m	140	191	236	140	191	236	286	350	477
Instantaneous Peak Torque*	N·m	350	478	589	350	478	589	715	875	1193
Instantaneous Peak/Stalling Torque Ratio*	%	250								
Rated Speed*	min^{-1}	1500								
Max. Speed*	min^{-1}	2000								
Rotor Moment of Inertia*	kg·m^2 ×10^{-4}	366	498	595	366	498	595	1071	1290	1804
Rated Power Rate*	kW/s	536	735	935	536	733	933	765	950	1265
Rated Angular Acceleration*	rad/s^2	3827	3835	3960	3827	3536	3960	2675	2715	2645
Rated Current (continuous)*	Arms	88	120	152	44	60	76	102	117	150
Instantaneous Max. Current*	Arms	240	340	460	120	170	230	280	340	450
Applicable SERVOPACK	SGDH-	2BAEB	3ZAEB	3GAEB	2BDEB	3ZDEB	3GDEB	4EDEB	5EDEB	9ZDEB

* : These items were obtained with a servomotor combined with a SERVOPACK at an armature winding temperature of 20℃.

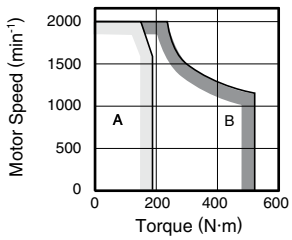
●Torque-Motor Speed Characteristics

A : Continuous Duty Zone B : Intermittent Duty Zone

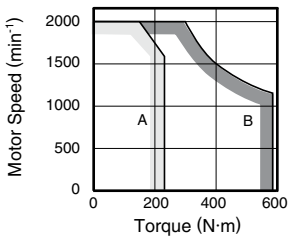
SGMVH-2BA□B



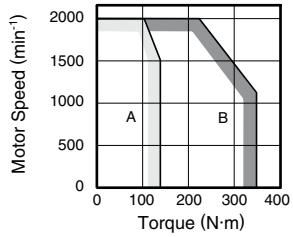
SGMVH-3ZA□B



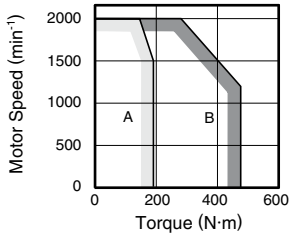
SGMVH-3GA□B



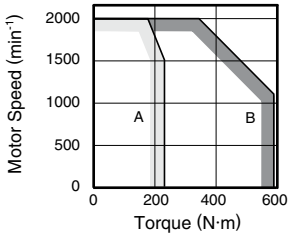
SGMVH-2BD□B



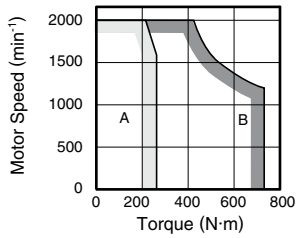
SGMVH-3ZD□B



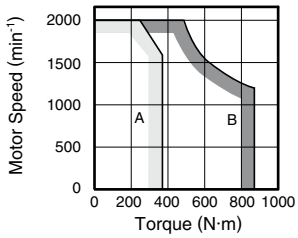
SGMVH-3GD□B



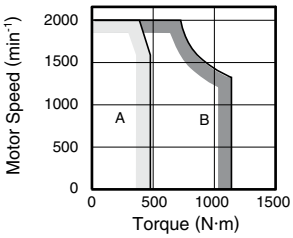
SGMVH-4ED□B



SGMVH-5ED□B



SGMVH-7ED□B



Notes: 1 Torque in the intermittent duty zone is applicable when the RMS torque of the servomotors is in the continuous duty zone.
2 The torque-motor speed characteristics were obtained with a servomotor combined with a SERVOPACK at an armature winding temperature of 20℃.

●Allowable Load Moment of Inertia at the Motor Shaft

Voltage	Servomotor Model SGMVH-	Allowable Load Moment of Inertia kg·m^2 ×10^{-4}	Voltage	Servomotor Model SGMVH-	Allowable Load Moment of Inertia kg·m^2 ×10^{-4}
200 V	2BA□B	1830	400 V	2BD□B	1830
				3ZD□B	2490
	3ZA□B	2490		3GD□B	2975
				4ED□B	5355
	3GA□B	2975		5ED□B	6450
				7ED□B	9020

800 min^{-1} Series — Ratings and Specifications

Note: 800 min^{-1} series is semi-standard product.

Time Rating : Continuous
Vibration Class : V15
Ambient Temperature : 0 to 40℃

Excitation : Permanent magnet
Mounting : Flange mounted (standard)
Foot mounted (semi-standard)

Thermal Class : F
Enclosure : Totally enclosed, cooled separately, IP44
Ambient Humidity : 20% to 80% (no condensation)

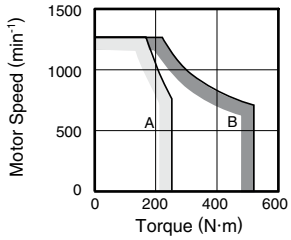
Voltage Class		200 V			400 V			
Servomotor Model	SGMVH-	2BA□D	3ZA□D	3GA□D	2BD□D	3ZD□D	3GD□D	4ED□D
Rated Output*	kW	22	30	37	22	30	37	45
Rated Torque*	N·m	262	358	442	262	358	442	537
Stalling Torque*	N·m	262	358	442	262	358	442	537
Instantaneous Peak Torque*	N·m	526	752	930	256	752	930	1182
Instantaneous Peak/Stalling Torque Ratio*	%	200	210		200	210		220
Rated Speed*	min^{-1}	800						
Max. Speed*	min^{-1}	1300						
Rotor Moment of Inertia*	kg·m^2 ×10^{-4}	705	1290	1564	705	1290	1564	1804
Rated Power Rate*	kW/s	979	994	1248	979	994	1248	1600
Rated Angular Acceleration*	rad/s^2	3726	2777	2824	3726	2777	2824	2978
Rated Current (continuous)*	Arms	104	150	195	52	75	98	110
Instantaneous Max. Current*	Arms	240	340	460	120	170	230	280
Applicable SERVOPACK	SGDH-	2BAEB	3ZAEB	3GAEB	2BDEB	3ZDEB	3GDEB	4EDEB

∗ : These items were obtained with a servomotor combined with a SERVOPACK at an armature winding temperature of 20℃.

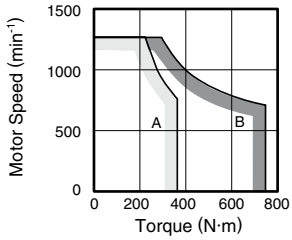
●Torque-Motor Speed Characteristics

A : Continuous Duty Zone B : Intermittent Duty Zone

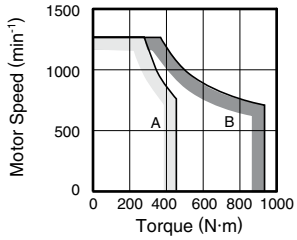
SGMVH-2BA□D



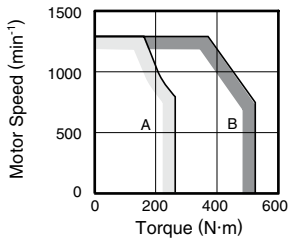
SGMVH-3ZA□D



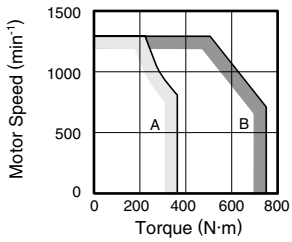
SGMVH-3GA□D



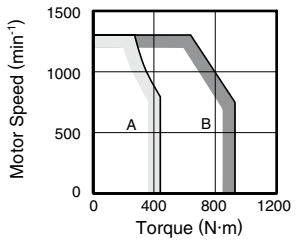
SGMVH-2BD□D



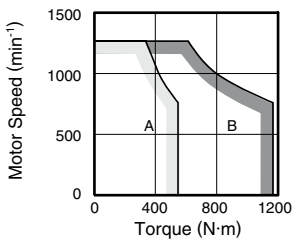
SGMVH-3ZD□D



SGMVH-3GD□D



SGMVH-4ED□D

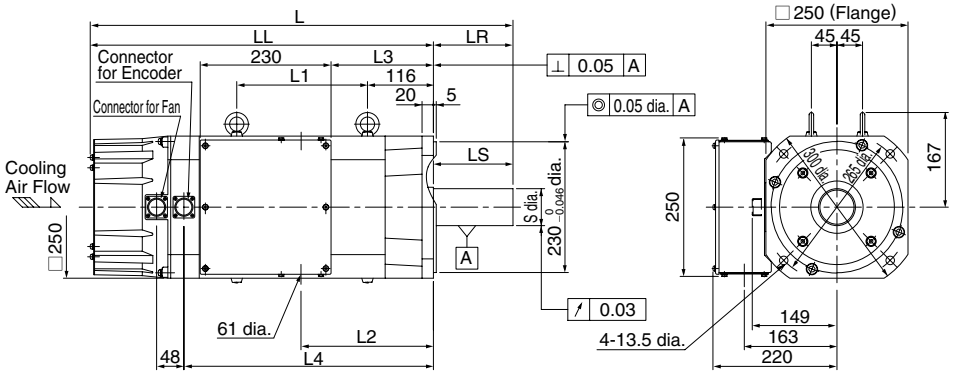


Notes: 1 Torque in the intermittent duty zone is applicable when the RMS torque of the servomotors is in the continuous duty zone.
2 The torque-motor speed characteristics were obtained with a servomotor combined with a SERVOPACK at an armature winding temperature of 20℃.

●Allowable Load Moment of Inertia at the Motor Shaft

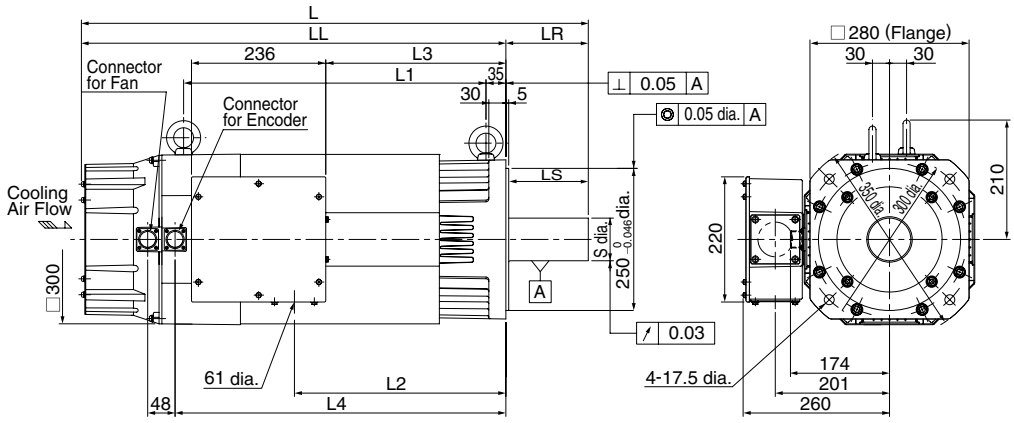
Voltage	Servomotor Model SGMVH-	Allowable Load Moment of Inertia kg·m^2 ×10^{-4}	Voltage	Servomotor Model SGMVH-	Allowable Load Moment of Inertia kg·m^2 ×10^{-4}
200 V	2BA□D	3525	400 V	2BD□D	3525
	3ZA□D	6450		3ZD□D	6450
	3GA□D	7820		3GD□D	7820
				4ED□D	9020

●Flange-mounted type (standard)



Model SGMVH-		L	LL	LR	LS	S	L1	L2	L3	L4	Approx. Mass
200-V class	400-V class										kg
2BA□B	2BD□B	658	518	140	140	$60^{+0.030}_{+0.011}$	144	147	94	353	95
3ZA□B	3ZD□B	704	564	140	140	$60^{+0.030}_{+0.011}$	190	193	140	399	110
3GA□B	3GD□B	744	604	140	140	$65^{+0.030}_{+0.011}$	230	233	180	439	120

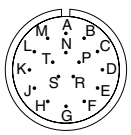
Note: For more information about foot-mounted type servomotors, contact your Yaskawa representative.



Model SGMVH-	L	LL	LR	LS	S	L1	L2	L3	L4	Approx. Mass
400-V class										kg
4ED□B	797	652	145	140	$75^{+0.030}_{+0.011}$	437	277	222	487	165
5ED□B	842	697	145	140	$75^{+0.030}_{+0.011}$	482	322	267	532	185
7ED□B	973	798	175	170	$85^{+0.035}_{+0.013}$	572	412	357	622	225

Note: For more information about foot-mounted type servomotors, contact your Yaskawa representative.

●Connector for Encoder



Receptacle : 97F-3102E20-29P

Plug L-shape: JA08A-20-29S-J1-EB(CE conformance) or MS3108B20-29S
Straight: JA06A-20-29S-J1-EB(CE conformance) or MS3106B20-29S
Cable Clamp : JL04-2022CKE(✻✻)(CE conformance) or MS3057-12A

Notes:1 ✻✻ will be replaced by cable diameter.
2 Items surrounded by rectangle should be prepared by customer.
3 A connector conformed to CE marking requires a CE conformed plug and a cable clamp.

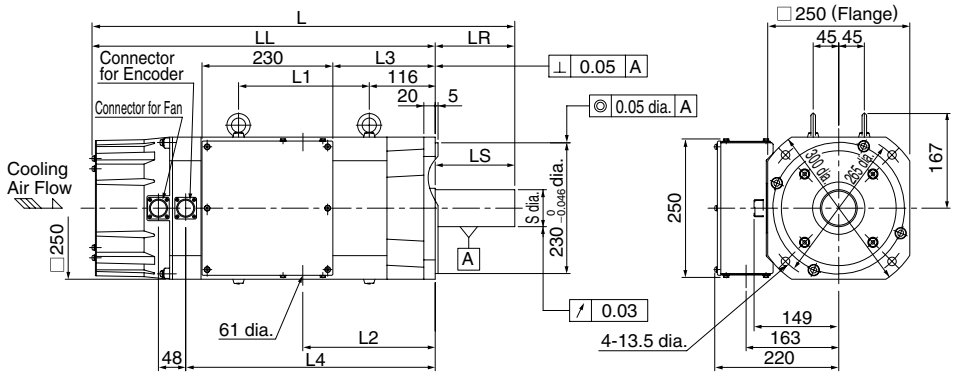
Absolute Encoder

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

Incremental Encoder

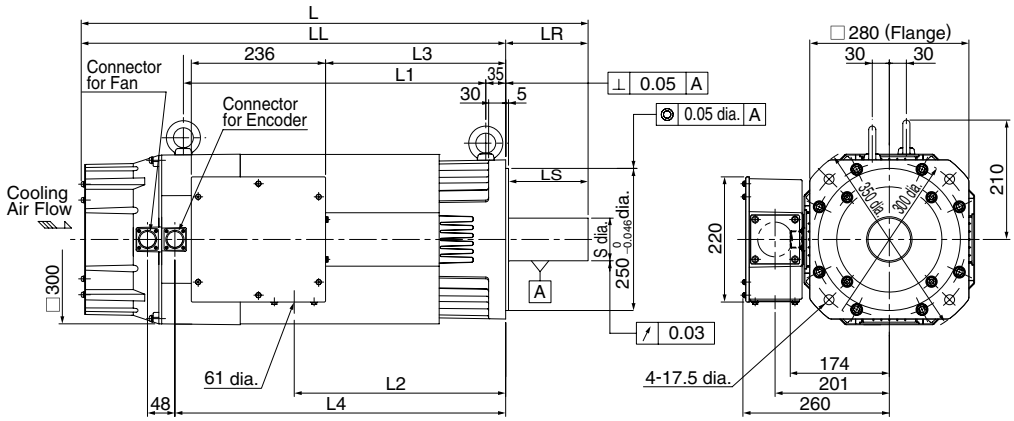
A	—	K	—
B	—	L	—
C	DATA+	M	—
D	DATA−	N	—
E	—	P	—
F	—	R	—
G	0 V	S	—
H	+5 VDC	T	—
J	FG(Frame Ground)		

●Flange-mounted type (standard)



Model SGMVH-		L	LL	LR	LS	S	L1	L2	L3	L4	Approx. Mass
200-V class	400-V class										kg
2BA□D	2BD□D	794	654	140	140	$65^{+0.030}_{+0.011}$	280	283	230	489	135

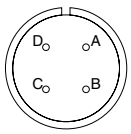
Note: For more information about foot-mounted type servomotors, contact your Yaskawa representative.



Model SGMVH-		L	LL	LR	LS	S	L1	L2	L3	L4	Approx. Mass
200-V class	400-V class										kg
3ZA□D	3ZD□D	842	697	145	140	$75^{+0.030}_{+0.011}$	482	322	267	532	185
3GA□D	3GD□D	892	747	145	140	$75^{+0.030}_{+0.011}$	532	372	317	582	205
–	4ED□D	973	798	175	170	$85^{+0.035}_{+0.013}$	572	412	357	622	225

Note: For more information about foot-mounted type servomotors, contact your Yaskawa representative.

●Connector for Fan



Receptacle : CE05-2A18-10PD-B

Plug L-shape:	CE05A-8A18-10SD-B-BAS(CE conformance) or MS3108B18-10S
Straight:	CE05-6A18-10SD-B-BSS(CE conformance) or MS3106B18-10S
Cable Clamp:	CE3057-10A-✻(D265)(CE conformance) or MS3057-10A

Notes:1 ✻ will be replaced by cable diameter.
2 Items surrounded by rectangle should be prepared by customer.
3 A connector conformed to CE marking requires a CE conformed plug and a cable clamp.

A	Fan Terminal (U)
B	Fan Terminal (V)
C	Fan Terminal (W)
D	

●Terminal Box

U, V, W	Motor terminal	M10
⏚	Grounding terminal	M10
1, 1b	Thermostat terminal	M4

Notes: Be sure to connect a thermostat to protect servomotors from overheating.

Ratings and Specifications

Voltage				200 V			400 V					
SERVOPACK Model SGDH-				2BAEB	3ZAEB	3GAEB	2BDEB	3ZDEB	3GDEB	4EDEB	5EDEB	9ZDEB
Applicable Servomotor Type SGMVH-				2BA□B 2BA□D*1	3ZA□B 3ZA□D*1	3GA□B 3GA□D*1	2BD□B 2BD□D*1	3ZD□B 3ZD□D*1	3GD□B 3GD□D*1	4ED□B 4ED□D*1	5ED□B	7ED□B
Continuous Output kW				22	30	37	22	30	37	45	55	75
Basic Specifications	Power Supply	Main Circuit		Three-phase 200 to 230 VAC/+10 to −15%, 50/60 Hz			Three-phase 380 to 480 VAC/+10 to −15%, 50/60 Hz					
		Main Circuit Power Capacity kVA		36.7	50.1	61.8	36.7	50.1	61.8	75.2	91.9	125.3
		Control Circuit		Single-phase 200 to 220 VAC/+10 to −15%, 50 Hz Single-phase 200 to 230 VAC/+10 to −15%, 60 Hz			24 VDC±15%					
		Control Circuit Power Capacity		150 VA			150 VA					
	Control Method			Three-phase full-wave rectification IGBT (insulated gate bipolar transistor), PWM (Pulse-width modulation), and sine-wave current drive.								
	Feedback			17-bit serial encoder (incremental/absolute), 20-bit serial encoder (absolute)								
	Usage/Storage Temperature			SERVOPACK : 0 to 55℃ /−20 to 85℃ Digital operator : 0 to 55℃ /−20 to 70℃								
	Usage/Storage Humidity			90%RH or less (no condensation)								
	Control Method	Speed Control		±6 VDC (Changeable setting range: ±2 V to ±10 VDC) at rated speed (forward rotation for positive reference) Input voltage: ±12 V max.								
		Torque Control		±3 VDC (Changeable setting range: ±1 V to ±10 VDC) at rated torque (forward torque reference for positive reference) Input voltage: ±12 V max.								
		Position Control		Input form: Sign +pulse train, CW+CCW pulse train, 90˚ phase difference 2-phase pulse Input fequency: 500/200 kpps (line driver/open collector output)								
	I/O Signals	Position Control	Output Form	Phase A, phase B, phase C: Line-driver output Phase S: Line-driver output (Only with an absolute encoder)								
			Frequency Dividing Ratio	Arbitrary								
		Sequence Input Signal		Servo ON, forward run prohibit (P-OT), reverse run prohibit (N-OT), forward current limit, reverse current limit, alarm reset, P control								
		Sequence Output Signal		Servo alarm, 3-bit alarm code is fixed output Select three signals from servo ready, current limit detection, TGON, positioning completed (speed agree), brake release, overload warning, overload detected								
Functions/Performance	Frequency Response			100 Hz (motor inertia = load inertia)								
	DB (Dynamic Brake)*2			Built-in (External resistor is required.)		External DB contactor and DB resistor are required.	Built-in (External resistor is required.)		External DB contactor and DB resistor are required.			
	Regeneration			Built-in (External resistor is required.)								
	Protection			Overcurrent, overload, regenerative error, main circuit voltage error, heatsink overheat, power open phase, overspeed, encoder error, encoder disconnected, overrun, CPU error, overflow, parameter error								
	Display			POWER, ALARM, CHARGE display LED 5-digit, 7-segment LED on digital operator								
	Others			Zero-clamp, soft start/stop, reverse rotation connection, brake interlock signal output, JOG run								
	Digital Operator Type			JUSP-OP02A-2								
Mounting Method				Base mounted								
Peripheral Devices	Regenerative-resistor unit JUSP-			RA08	RA09	RA11	RA12	RA13	RA14	RA15	RA16	RA25
	DB resistor unit JUSP-			DB01	DB01	DB02	DB03	DB03	DB04	DB05	DB06	DB12

*1 : The SERVOPACK models are semi-standard products.
*2 : DB (Dynamic Brake): an automatic brake which operates when main power is OFF, when servo is OFF, when there is a servo alarm, or during an overtravel state.

External Dimensions Units: mm

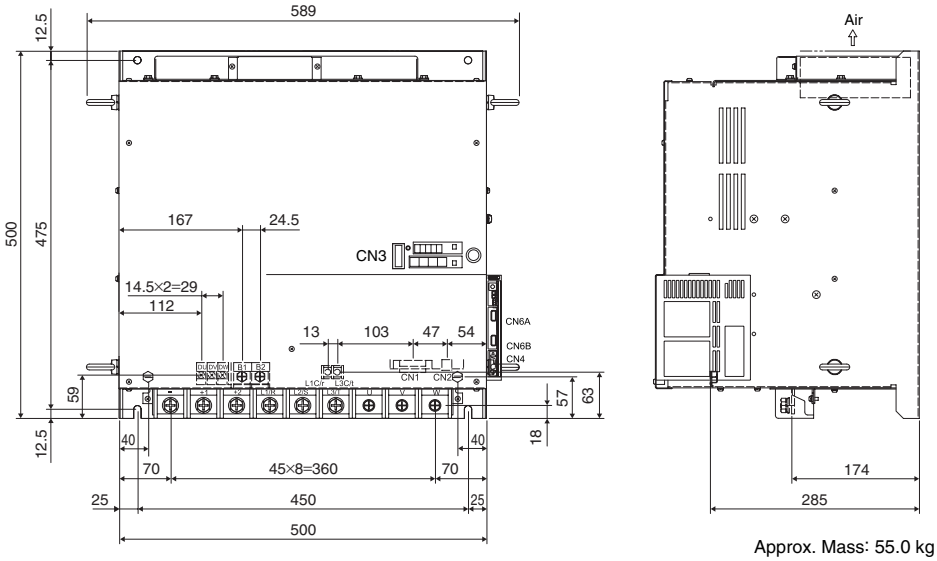
■ Three-phase 200-V Class

Common for all types of SERVOPACK

Symbol	Connector for SERVOPACK	Made by
CN1	10250-52AJL	SUMITOMO 3M LTD
CN2	10220-52AJL	
CN3	17JE-13090-37(D2B)	DDK Ltd.

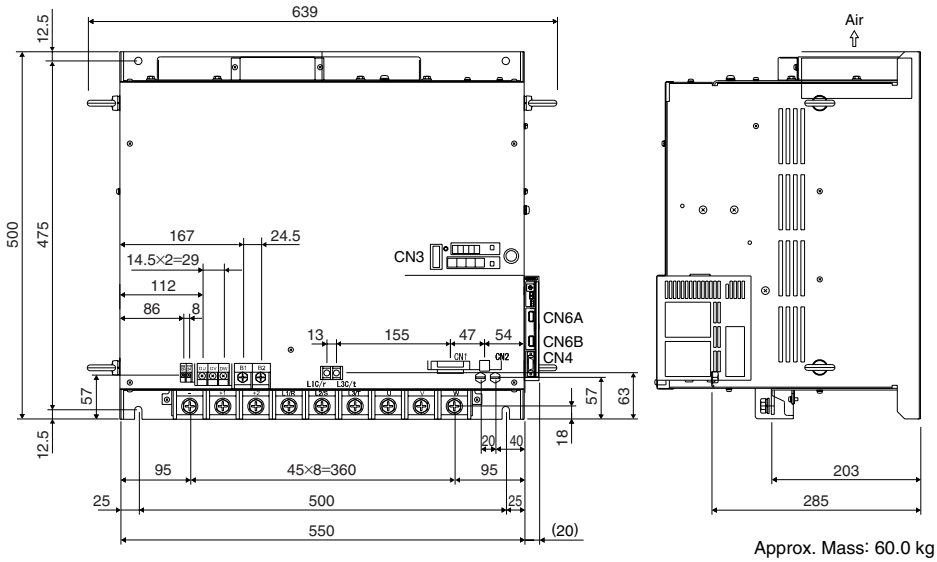
Painting color of front cover and case : 5Y 7/1 Munsell notation

SGDH-2BAEB (22 kW)
SGDH-3ZAEB (30 kW)



Approx. Mass: 55.0 kg

SGDH-3GAEB (37 kW)

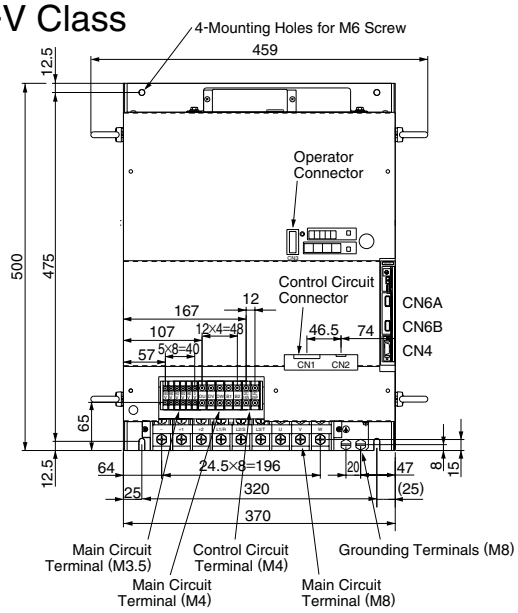


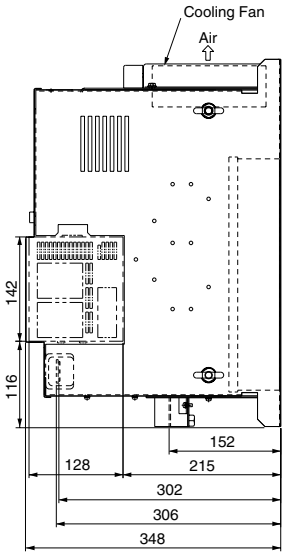
Approx. Mass: 60.0 kg

External Dimensions Units: mm

■ Three-phase 400-V Class

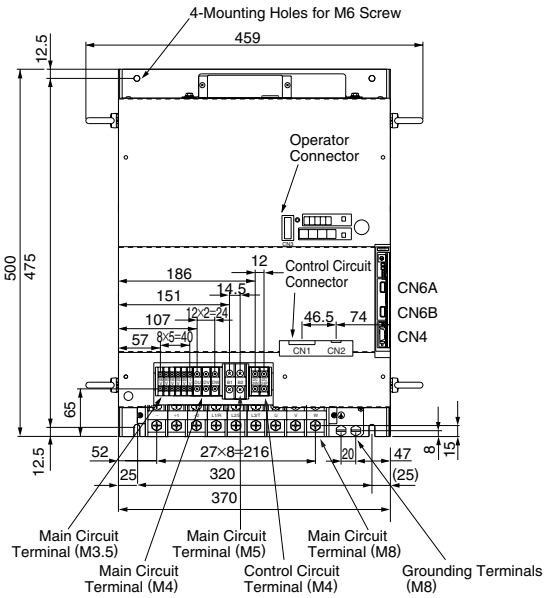
SGDH-2BDEB (22 kW)

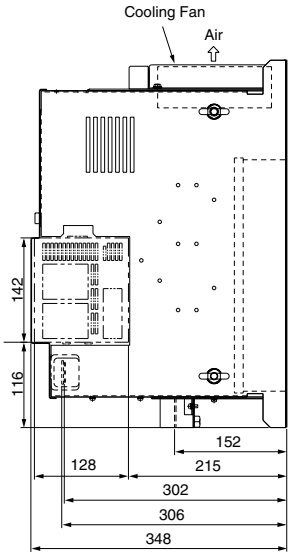




Approx. Mass: 40.0 kg

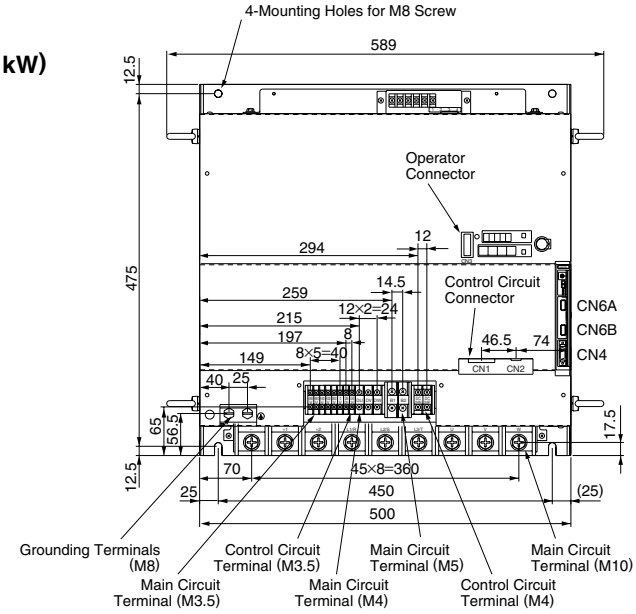
SGDH-3ZDEB (30 kW)

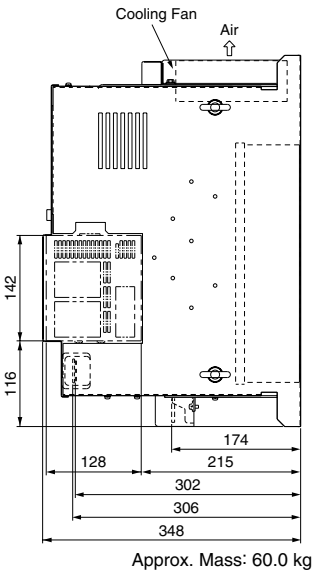




Approx. Mass: 40.0 kg

SGDH-3GDEB (37 kW)

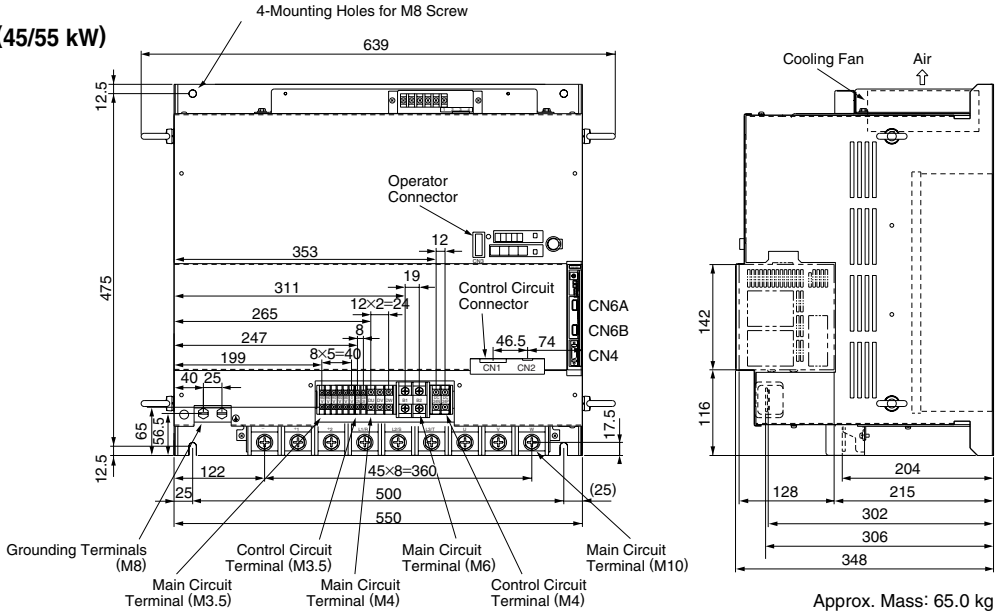




Approx. Mass: 60.0 kg

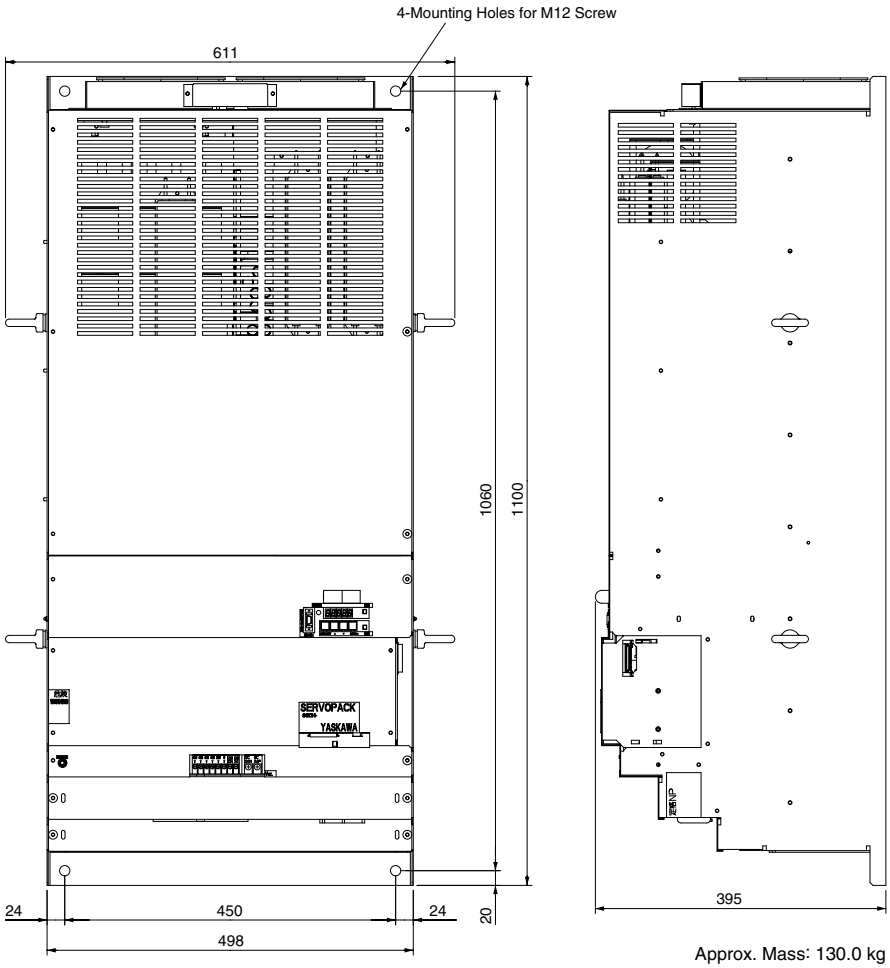
External Dimensions Units: mm

SGDH-4EDEB/-5EDEB (45/55 kW)



Approx. Mass: 65.0 kg

SGDH-9ZDEB (75 kW)

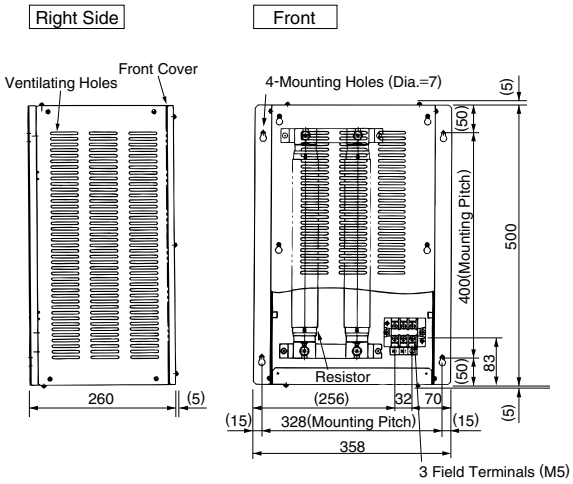


Approx. Mass: 130.0 kg

Regenerative Resistor Unit Units: mm

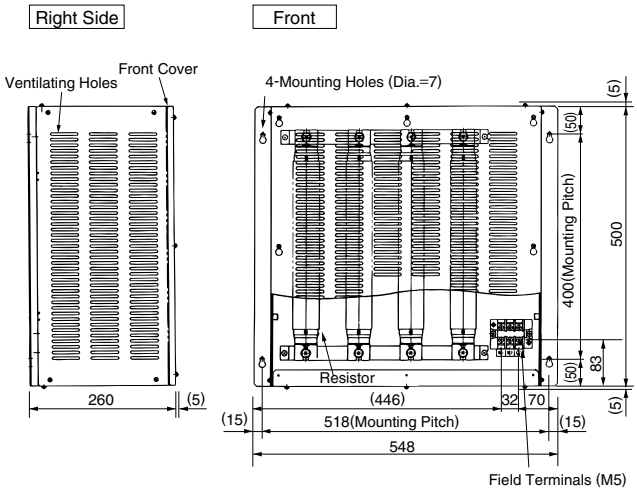
■ For 200-V Class

JUSP-RA08 (For 22 kW)



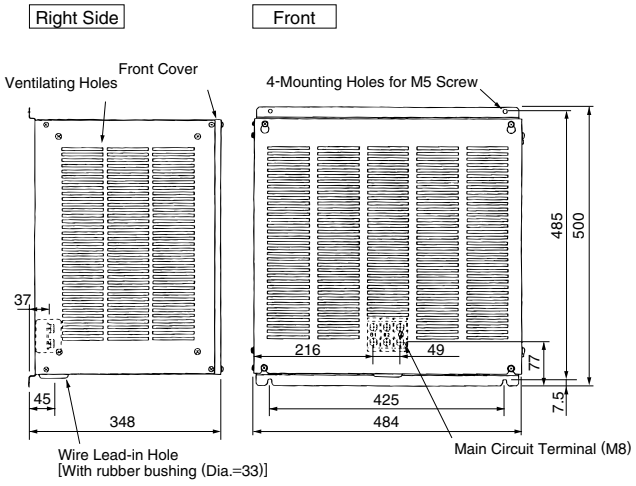
Approx. Mass: 14.0 kg

JUSP-RA09 (For 30 kW)



Approx. Mass: 21.0 kg

JUSP-RA11 (For 37 kW)

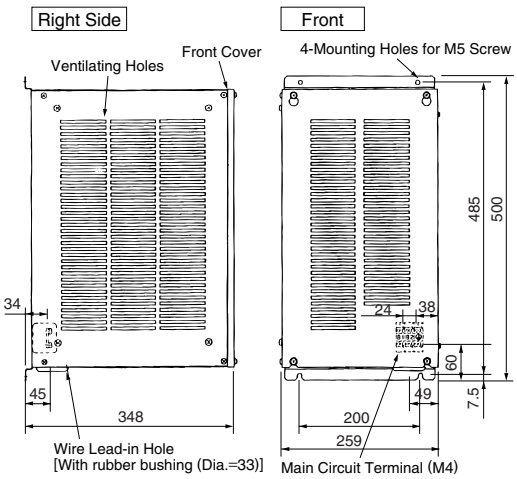


Approx. Mass: 20.5 kg

Regenerative Resistor Unit Units: mm

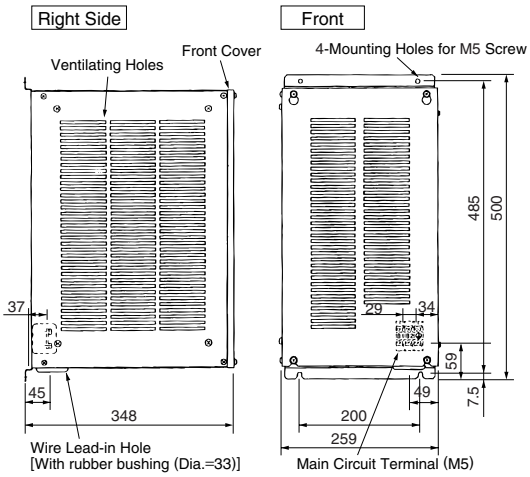
■ For 400-V Class

JUSP-RA12 (For 22 kW)



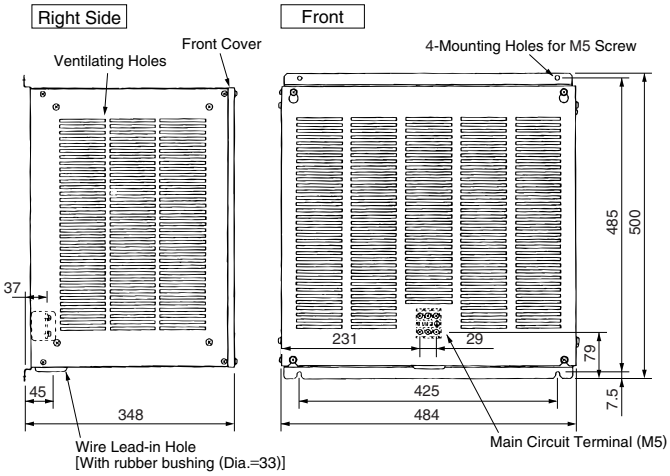
Approx. Mass: 14.0 kg

JUSP-RA13 (For 30 kW)



Approx. Mass: 14.0 kg

JUSP-RA14 (For 37 kW)

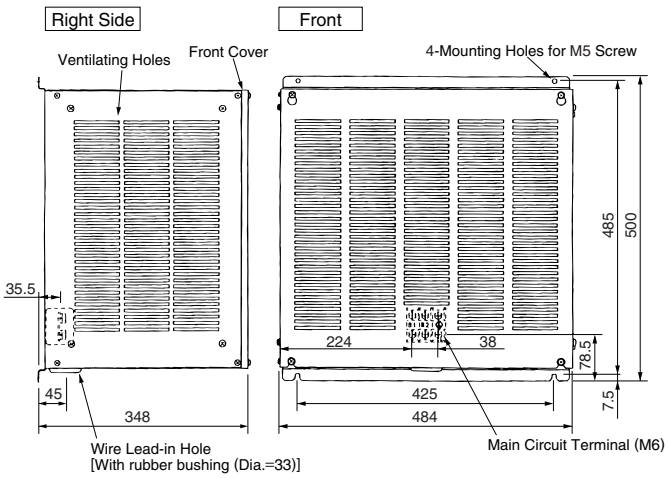


Approx. Mass: 20.0 kg

Regenerative Resistor Unit Units: mm

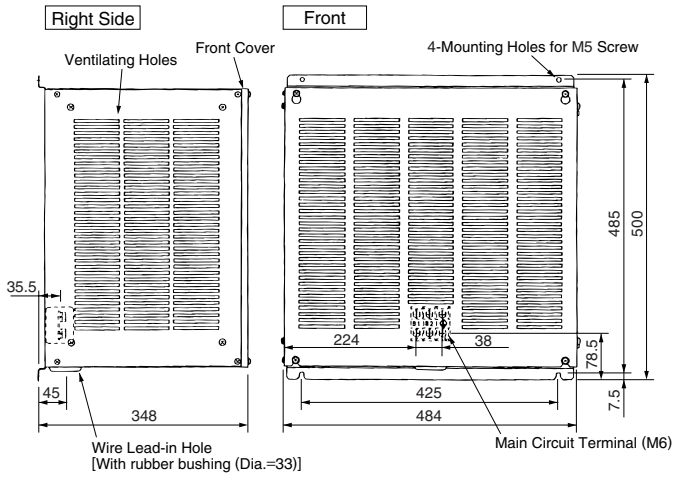
■ For 400-V Class (cont'd)

JUSP-RA15 (For 45 kW)



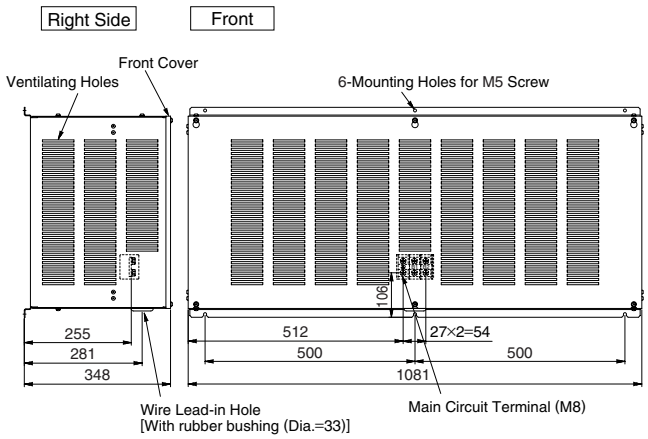
Approx. Mass: 21.5 kg

JUSP-RA16 (For 55 kW)



Approx. Mass: 23.5 kg

JUSP-RA25 (For 75 kW)

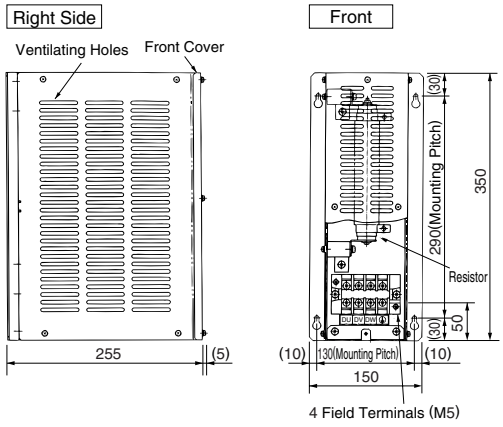


Approx. Mass: 45.0 kg

DB Resistor Unit Units: mm

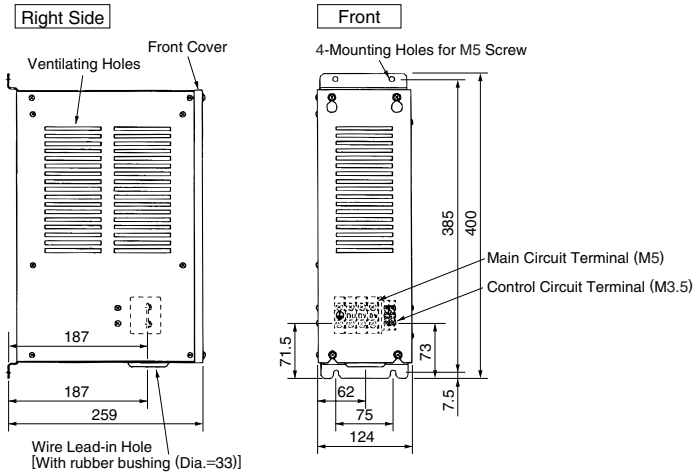
■ For 200-V Class

JUSP-DB01 (For 22/30 kW)



Approx. Mass: 5.0 kg

JUSP-DB02 (For 37 kW)

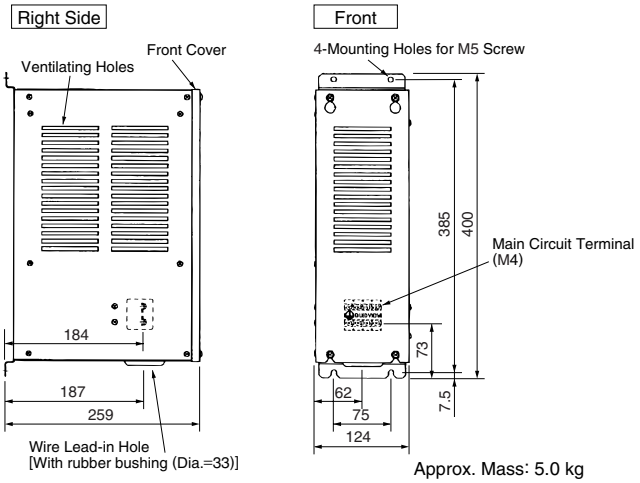


Approx. Mass: 6.0 kg

DB Resistor Unit Units: mm

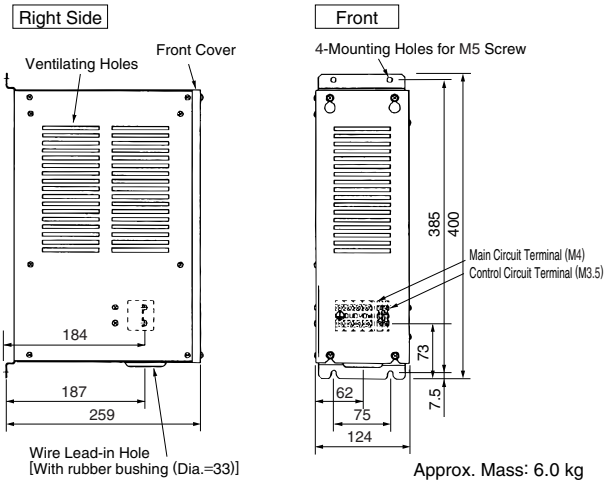
■ For 400-V Class

JUSP-DB03 (For 22/30 kW)



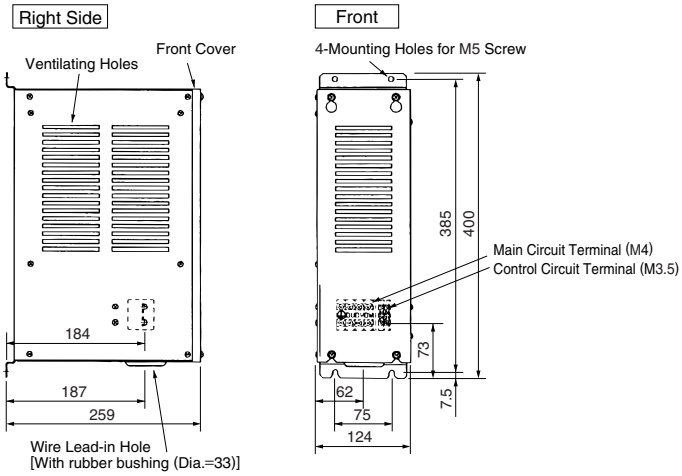
Approx. Mass: 5.0 kg

JUSP-DB04 (For 37 kW)



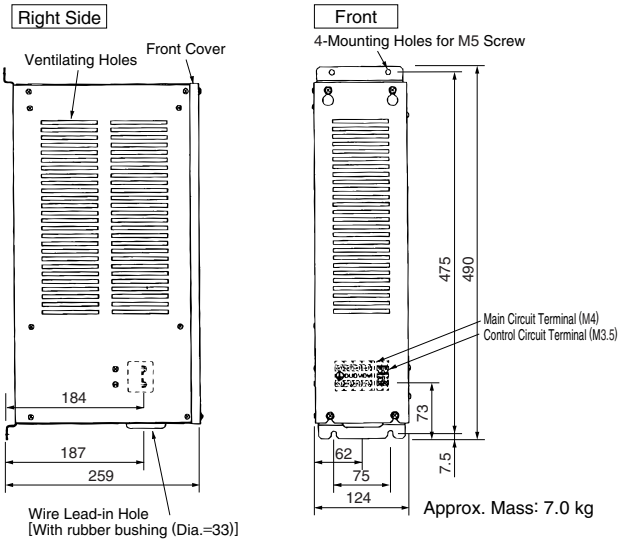
Approx. Mass: 6.0 kg

JUSP-DB05 (For 45 kW)



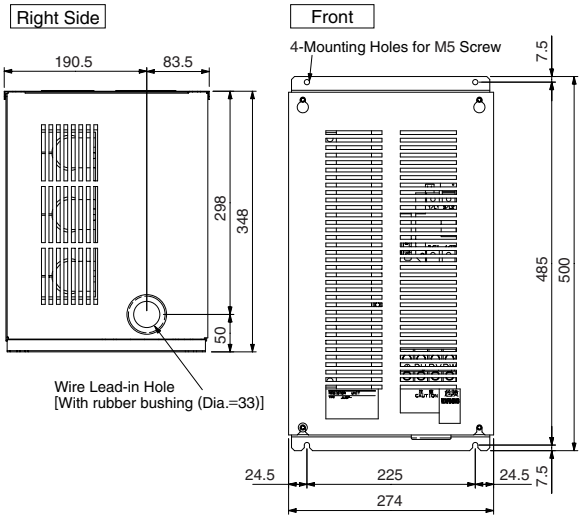
Approx. Mass: 6.0 kg

JUSP-DB06 (For 55 kW)



Approx. Mass: 7.0 kg

JUSP-DB12 (For 75 kW)

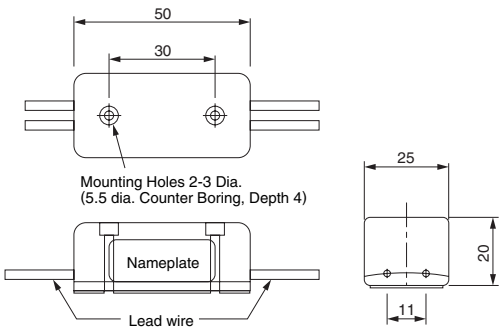


Approx. Mass: 16.0 kg

Holding Brake Power Supply Unit

200 V input: LPSE-2H01-E
100 V input: LPDE-1H01-E

●External Dimensions (Units: mm)



●Specifications

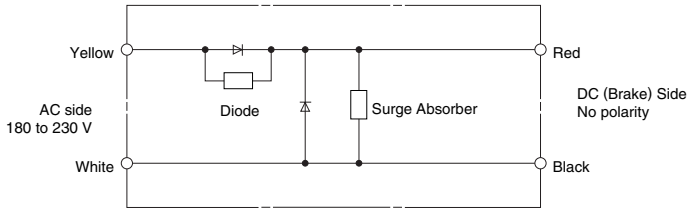
Rated output voltage:90 VDC
Maximum output current: DC1.0 A
Lead wire length: 500 mm each
Maximum ambient temperature: 60℃
Lead wires: Color coded (refer to the table below)

AC input		Brake end
100 V	200 V	
Blue/white	Yellow/white	Red/black

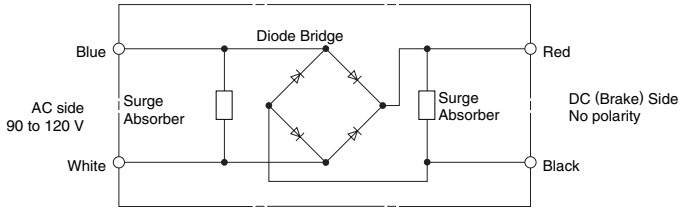
●Internal Circuits

We recommend opening or closing the circuit for the holding brake's power supply so that switching will occur on the DC side of the holding brake power supply unit. This will reduce brake operation time compared to switching on the AC side.
When switching on the DC side, install an extra surge absorber near the brake coil apart from the surge absorber built into the brake circuit in order to prevent damage to the brake coil from surge voltage.

Brake Power Supply for 200 VAC
Internal Circuit for Model: LPSE-2H01-E



Brake Power Supply for 100 VAC
Internal Circuit for Model: LPDE-1H01-E



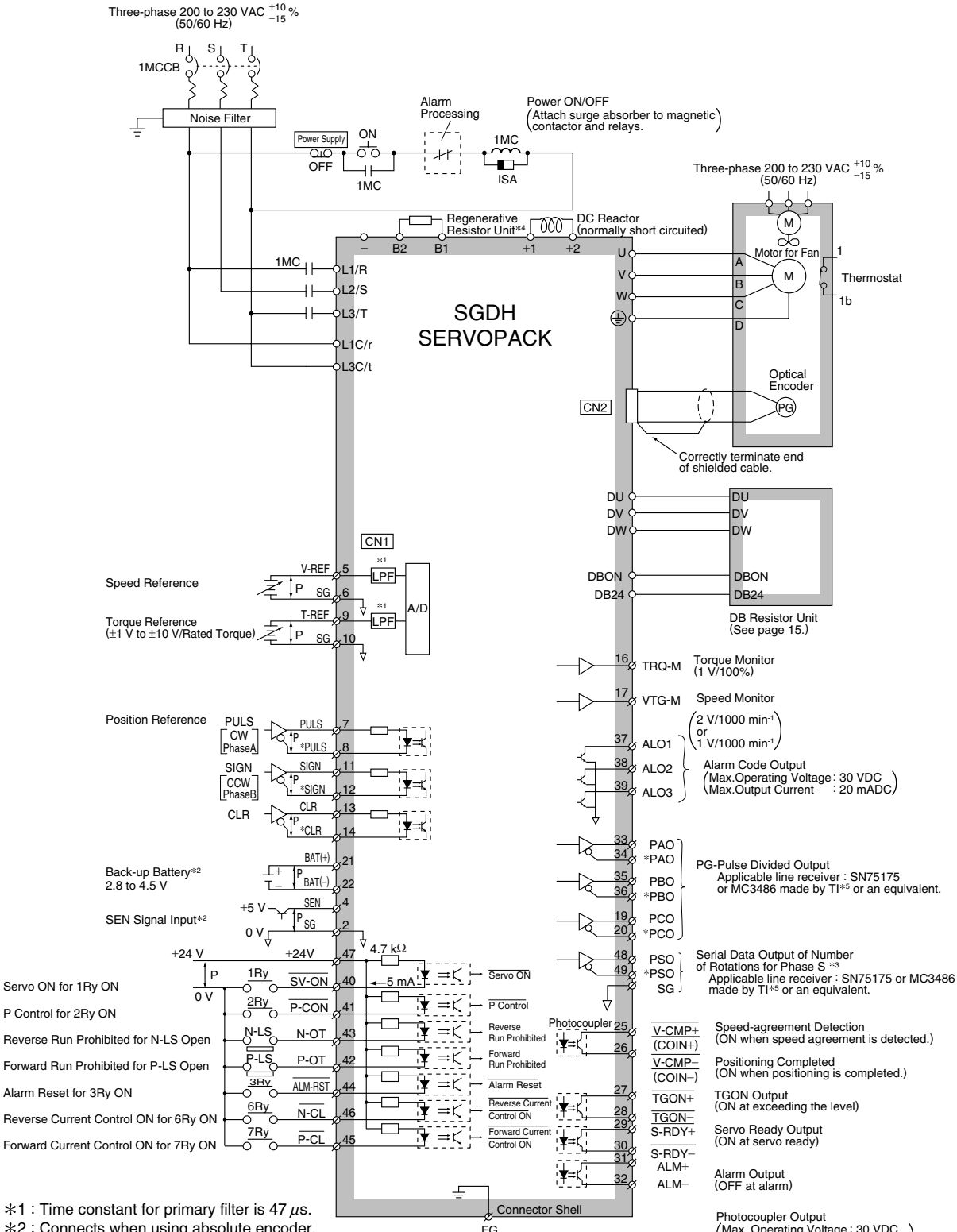
IMPORTANT

- We recommend opening or closing the circuit for the holding brake's power supply so that switching will occur on the DC side of the holding brake power supply unit. This will reduce brake operation time compared to switching on the AC side.
- When switching on the DC side, install an extra surge absorber near the brake coil apart from the surge absorber built into the brake circuit in order to prevent damage to the brake coil from surge voltage.
- Holding brake power supply units for 24 VDC are not provided by Yaskawa. Please order these separately from other manufacturers. Be sure to match the output voltage of the holding brake power supply units to the SERVOPACKs. A mismatch may cause overcurrent, resulting in burning of the units.

Connection Examples

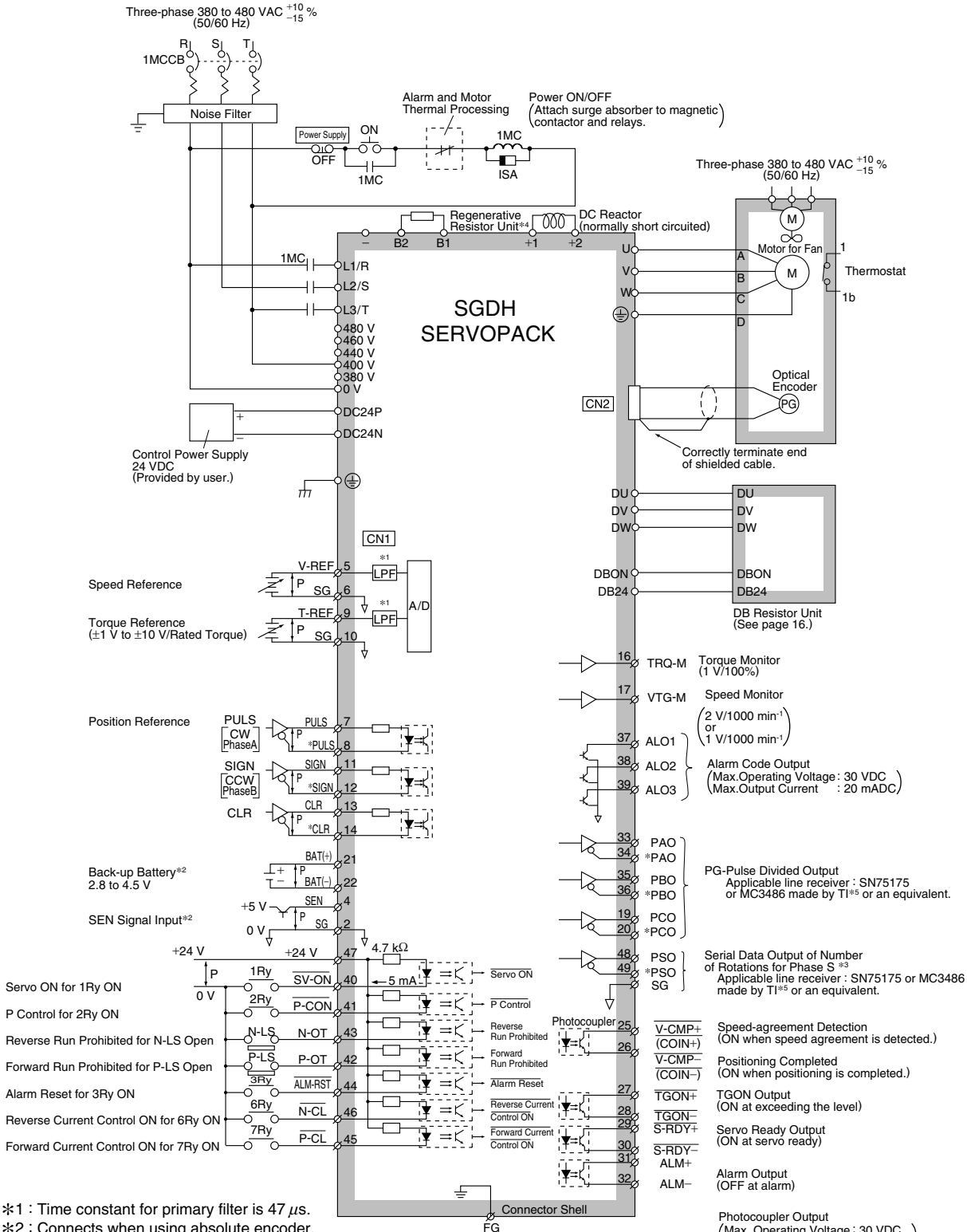
Standard Connections

■ Three-phase 200 V



∗1 : Time constant for primary filter is 47 μs.
∗2 : Connects when using absolute encoder.
∗3 : Effective when using absolute encoder.
∗4 : Regenerative resistor unit (optional) should be mounted externally.
∗5 : TI stands for Texas Instruments Inc.
Note: IP represents twisted pair cable.

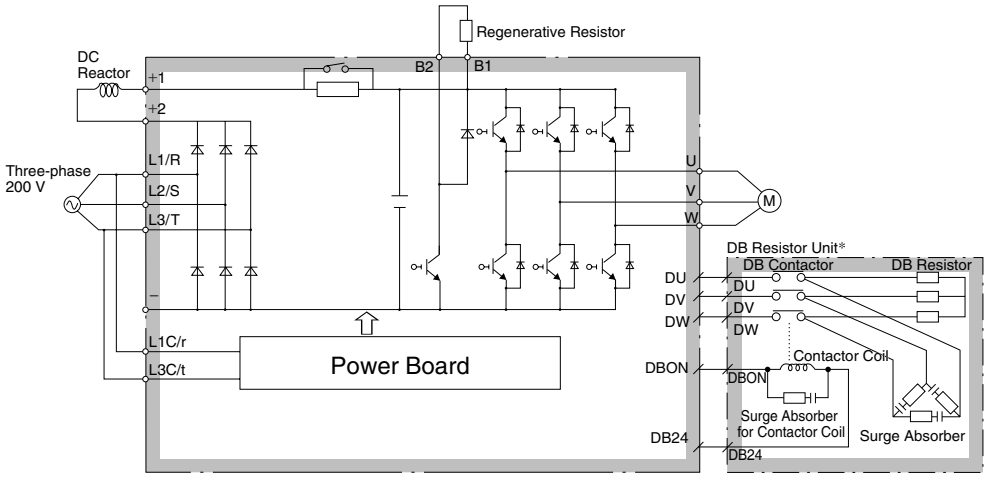
■ Three-phase 400 V



∗1 : Time constant for primary filter is 47 μs.
∗2 : Connects when using absolute encoder.
∗3 : Effective when using absolute encoder.
∗4 : Regenerative resistor unit (optional) should be mounted externally.
∗5 : TI stands for Texas Instruments Inc.
Note: ⊥P represents twisted pair cable.

Main Circuit Terminal Description

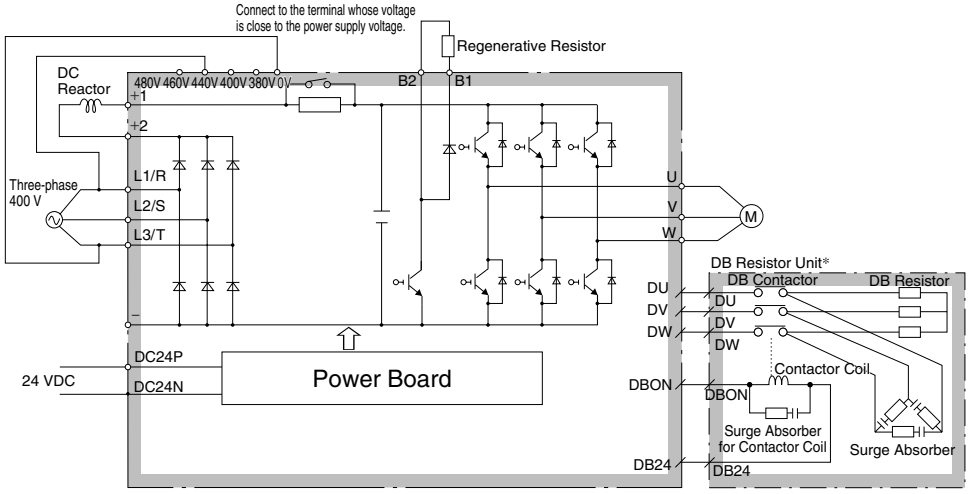
■ Three-phase 200 V



*: This diagram is an example of the connection of a DB resistor unit with a built-in surge absorber and a DB contactor for 37 kW SERVOPACKs. A DB resistor unit for 22/30 kW SERVOPACKs consists of a resistor only.

Terminal Symbol	Name	Description	Terminal Symbol	Name	Description
L1/R, L2/S, L3/T	Main Circuit Power Supply Input Terminal	Three-phase 200 V to 230 VAC/+10 to −15%, 50/60 Hz	B1, B2	Regenerative Resistor Connection Terminal	Connects regenerative resistor.
L1C/r, L3C/t	Control Power Supply Input Terminal	Single-phase 200 V to 220 VAC/+10 to −15%, 50 Hz Single-phase 200 V to 230 VAC/+10 to −15%, 60 Hz	–	Main Circuit Negative Side Terminal	(Normally external connection is not necessary.)
U, V, W	Motor Connection Terminal	Connects with motor.	DU, DV, DW,	DB Resistor Unit, DB Contactor Connection Terminal	Connects to a DB resistor unit or a DB contactor.
⏚ (×2)	Grounding Terminal	Grounds (for grounding power supply and motor).			
+1, +2	DC Reactor Connection Terminal	Connects DC reactor for suppressing high-harmonic wave. If not necessary, shorten the terminals.	DBON, DB24	DB Resistor Unit Connection Terminal	For 37 kW SERVOPACK, connects to DBON and DB24 terminals of DB resistor unit.

■ Three-phase 400 V



*: This diagram is an example of the connection of a DB resistor unit with a built-in surge absorber and a DB contactor for 37 kW to 75 kW SERVOPACKs.

Terminal Symbol	Name	Description	Terminal Symbol	Name	Description
L1/R, L2/S, L3/T	Main Circuit Power Supply Input Terminal	Three-phase 380 V to 480 VAC/+10 to −15%, 50/60 Hz	480 V, 460 V, 440 V, 400 V, 380 V, 0 V	Input Terminals for Actuator Control	Connects to the terminal whose voltage is close to the power supply voltage.
U, V, W	Motor Connection Terminal	Connects with motor.			
DC24P DC24N	Control Power Supply Input Terminal	24 VDC±15%	–	Main Circuit Negative Side Terminal	(Normally external connection is not necessary.)
⏚ (×2)	Grounding Terminal	Grounds (for grounding power supply and motor).	DU, DV, DW	DB Resistor Unit, DB Contactor Connection Terminal	Connects to a DB resistor unit or a DB contactor.
+1, +2	DC Reactor Connection Terminal	Connects DC reactor for suppressing high-harmonic wave. If not necessary, shorten the terminals.			
B1, B2	Regenerative Resistor Connection Terminal	Connects regenerative resistor.	DBON, DB24	DB Resistor Unit Connection Terminal	For 37 kW to 75 kW SERVOPACKs, connects to DBON and DB24 terminals of DB resistor unit.

Control Circuit Terminal Description

■ Three-phase 200 V, 400 V

Refer to the following Encoder Connections for more information on CN1 output processing and CN2 connection.

CN1 (Control I/O) Terminal Layout

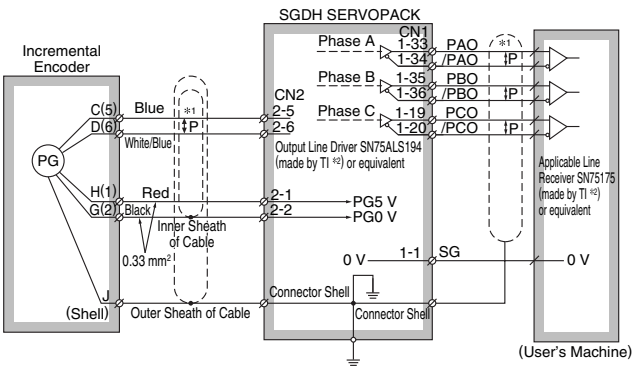
2	SG	GND	1	SG	GND	27	/TGON+	TGON output signal	26	/V-CMP– (/COIN–)	Speed agreement signal output
4	SEN	SEN signal input	3	PL1	Power supply for open collector ref.	29	/S-RDY+	Servo ready output	28	/TGON–	TGON output signal
6	SG	GND	5	V-REF	Speed ref. input	31	ALM+	Servo alarm output	30	/S-RDY–	Servo ready output
8	/PULS	Ref. pulse input	7	PULS	Ref. pulse input	33	PAO	PG pulse divided output phase A	32	ALM–	Servo alarm output
10	SG	GND	9	T-REF	Torque ref. input	35	PBO	PG pulse divided output phase B	34	/PAO	PG pulse divided output phase A
12	/SIGN	Ref. code input	11	SIGN	Ref. code input	37	ALO1	Alarm code output	36	/PBO	PG pulse divided output phase B
14	/CLR	Clear input	13	PL2	Power supply for open collector ref.	39	ALO3	Alarm code output	38	ALO2	Alarm code output
16	–	–	15	CLR	Clear input	41	P-CON	P control input	40	/S-ON	Servo ON input
18	PL3	Power supply for open collector ref.	17	–	–	43	N-OT	Rev. side overtravel input	42	P-OT	Fwd. overtravel input
20	/PCO	PG pulse divided output phase C	19	PCO	PG pulse divided output phase C	45	/P-CL	Fwd. current limit ON input	44	/ALM-RST	Alarm reset input
22	BAT(–)	Battery(–)	21	BAT(+)	Battery(+)	47	+24V -IN	External input power supply	46	/N-CL	Rev. current limit ON input
24	–	–	23	–	–	49	/PSO	Phase S signal output	48	PSO	Phase S signal output
			25	/V-CMP+ (/COIN+)	Speed agreement signal output				50	–	–

CN2 (Encoder Connection) Terminal Layout

1	PG5V	PG power supply +5 V	2	PG0V	PG power supply 0 V
3	BAT(+)	Battery(+) (absolute encoder only)	4	BAT(–)	Battery(–) (absolute encoder only)
5	PS	PG serial signal input	6	/PS	PG serial signal input

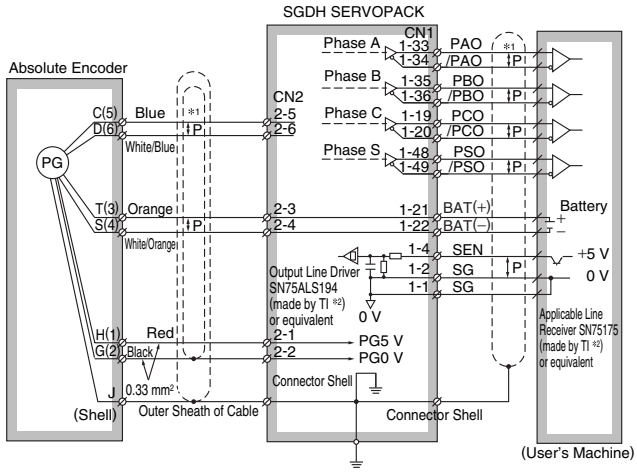
Encoder Connections

■ Incremental Encoder



*: 1 ⊏P represents twisted pair cable.
*: 2 TI stands for Texas Instruments Inc.

■ Absolute Encoder



*: 1 ⊏P represents twisted pair cable.
*: 2 TI stands for Texas Instruments Inc.

Ordering Reference

System Configuration Example

①Molded-case Circuit Breaker (MCCB)
Protects power supply line.

②Noise Filter
(FN series made by Schaffner EMC Systems)
Prevents external electrical noise from the power line.

③Magnetic Contactor
(HI series made by Yaskawa Controls Co., Ltd.)
Turns ON/OFF servo power suppply. Install a surge absorber.

④Brake Power Supply
Used for a servomotor with a brake.
LPDE-1H01(100 VAC input)
LPSE-2H01(200 VAC input)

⑤Transformer
Switches 400 V power supply to 200 V.

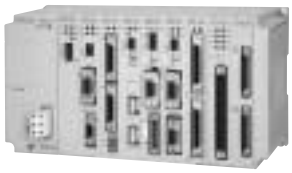
⑥DB Resistor Unit

Power Supply
Three-phase 200 VAC
Three-phase 400 VAC

⑦Wiring without application modules

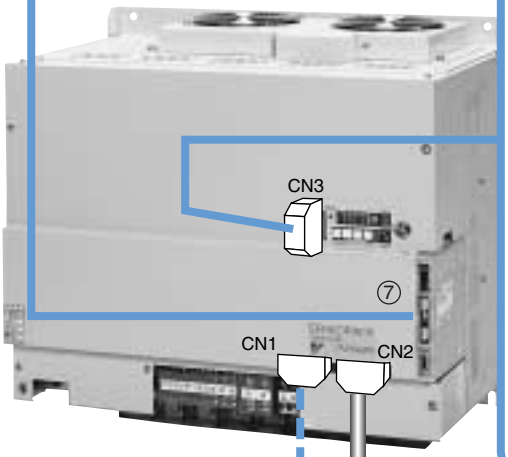
Host Controller

SGDH SERVOPACKs can be connected to a Yaskawa host controller or one made by other manufacturers.



MP2000

SGDH SERVOPACK



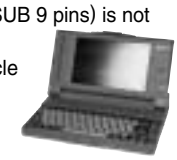
Digital Operator

Parameter setting, run command, and status/alarm display are performed.

Hand-held Type
(JUSP-OP02A-2)
1 m-cable is provided.

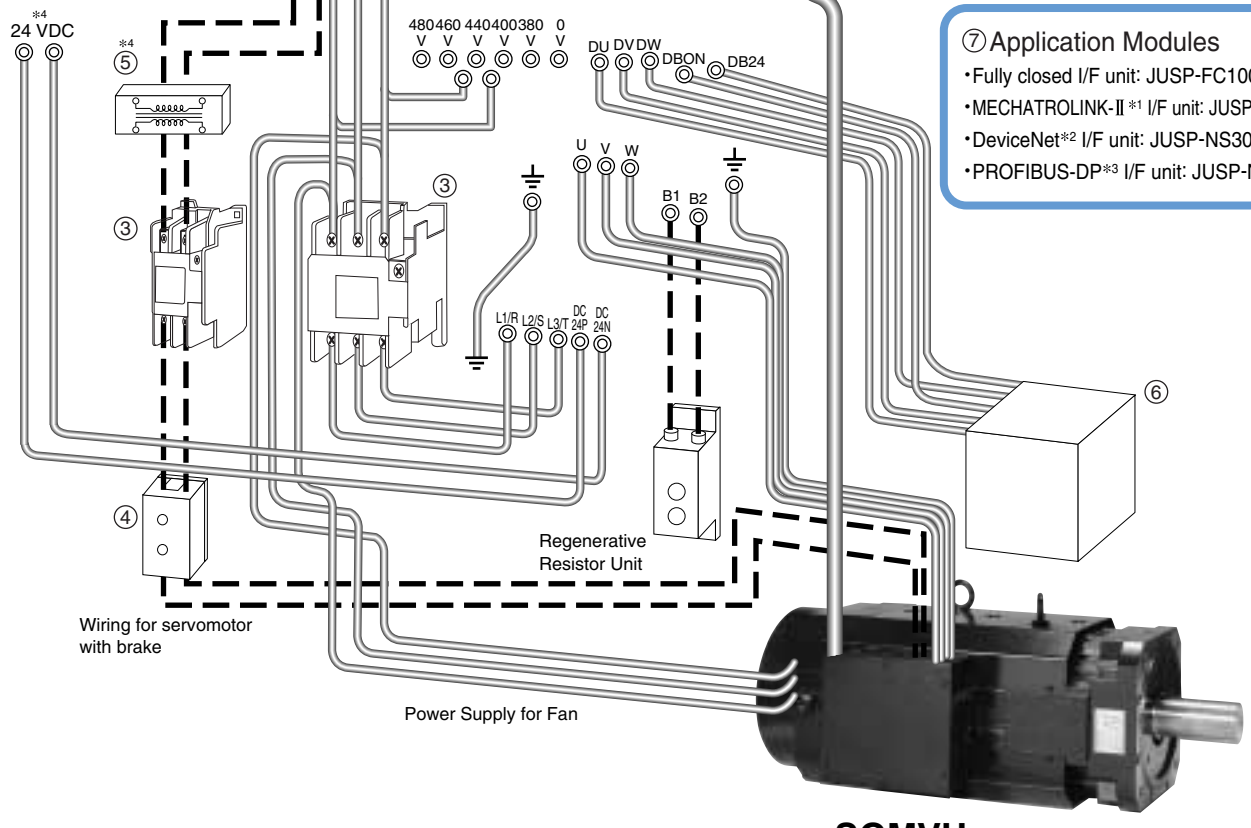
Personal Computer

The connector (D-SUB 9 pins) is not provided.
Applicable receptacle is 17JE-23090-02(D8B)
(made by DDK).



⑦Application Modules

- Fully closed I/F unit: JUSP-FC100
- MECHATROLINK-Ⅱ ※1 I/F unit: JUSP-NS115
- DeviceNet※2 I/F unit: JUSP-NS300
- PROFIBUS-DP※3 I/F unit: JUSP-NS500



SGMVH Servomotor

※1: Yaskawa's high-speed field network
※2: Registered trademark of the Open DeviceNet Vendor Association (ODVA)
※3: I/O networks developed and maintained by PROFIBUS International (PI)
※4: Required when using a 400 VAC power supply.

Order Form

●: Required
○: Select one from the list
◇: Optional

Product Name				Type	Q'ty
SGMVH Servomotor			●	SGMVH-□□□□□□□	
SGDH SERVOPACK			●	SGDH-□□□□EB	
For I/O Signals (CN1)					
CN1	Connector Terminal Unit (with CN1 connector and 0.5 m cable)		○	JUSP-TA50P	
	Cable with Single Connector (Loose wires at one end)	1 m	○	JZSP-CKI01-1	
		2 m		JZSP-CKI01-2	
		3 m		JZSP-CKI01-3	
For Encoder Signals (CN2)					
CN2 ⇕ Encoder	Cable with Single Connector (SERVOPACK Side: Connector, Encoder Side: Loose wire)	3 m	○	JZSP-CMP23-03	
		5 m		JZSP-CMP23-05	
		10 m		JZSP-CMP23-10	
		15 m		JZSP-CMP23-15	
		20 m		JZSP-CMP23-20	
	Cable with Connector on Both Ends (SERVOPACK Side: Connector, Encoder Side: Straight plug)	3 m	○	JZSP-CMP21-03	
		5 m		JZSP-CMP21-05	
		10 m		JZSP-CMP21-10	
		15 m		JZSP-CMP21-15	
		20 m		JZSP-CMP21-20	
	Cable with Connectors on Both Ends (SERVOPACK Side: Connector, Encoder Side: L-shape plug)	3 m	○	JZSP-CMP22-03	
		5 m		JZSP-CMP22-05	
		10 m		JZSP-CMP22-10	
		15 m		JZSP-CMP22-15	
		20 m		JZSP-CMP22-20	
	Encoder Cable without Connector	5 m	○	JZSP-CMP29-05	
		10 m		JZSP-CMP29-10	
		15 m		JZSP-CMP29-15	
		20 m		JZSP-CMP29-20	
		30 m		JZSP-CMP29-30	
		40 m		JZSP-CMP29-40	
		50 m		JZSP-CMP29-50	
	Connector Kit (for CN2)*1		○	JZSP-CMP9-1	
Servomotor end Connector*2	Plug for Encoder	L-Shape	○	MS3108B20-29S	
		Straight		MS3106B20-29S	
	Cable Clamp for Encoder			MS3057-12A	
	Plug for Fan on Motor Side	L-Shape	○	MS3108B18-10S	
		Straight		MS3106B18-10S	
	Cable Clamp for Fan on Motor Side			MS3057-10A	
For Setting Devices (CN3, CN5)					
CN3 ⇕ Setting Device	Digital Operator (Hand-held Type, with Cable)	1 m	◇	JUSP-OP02A-2	
	Cable for Connecting PC	D-sub 25 Pins 2 m	◇	JZSP-CMS01	
		PC/AT Compatible D-sub 9 pins 2 m		JZSP-CMS02	
		PC98 Half Pitch 14 pins 2 m		JZSP-CMS03	
CN5	Cable for Analog Monitor (With Single Connector)	1 m	◇	JZSP-CA01 or DE9404559	
MECHATROLINK-Ⅱ communication Cables					
CN6A CN6B	MECHATROLINK-Ⅱ communication Cable		◇	JEPMC-W6000-A3	
				JEPMC-W6000-A5	
				JEPMC-W6000-01	
	MECHATROLINK-Ⅱ communication Cable Terminator		◇	JEPMC-W6020	
Peripheral Devices (Optional)					
Regenerative Resistor Unit			○	JUSP-RA08/RA09/RA11/RA15/RA16/RA25	
DB Resistor Unit			◇	JUSP-DB01/DB02/DB05/DB06/DB12	
Holding Brake Power Supply (Required for servomotor with holding brake)	For 100 VAC		◇	LPDE-1H01	
	For 200 VAC			LPSE-2H01	
Battery (Required for absolute encoder)			◇	JZSP-BA01-1	

*1 : Made by Molex Japan Co.,Ltd.
*2 : Made by Japan Aviation Electronics Industry,Ltd. Water-resistance types are also available.
Note : Prepare DC power supply by customer (24 V±10% 5 A load possible).

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YASKAWA ELECTRIC CORPORATION

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In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply.

Specifications are subject to change without notice for ongoing product modifications and improvements.

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