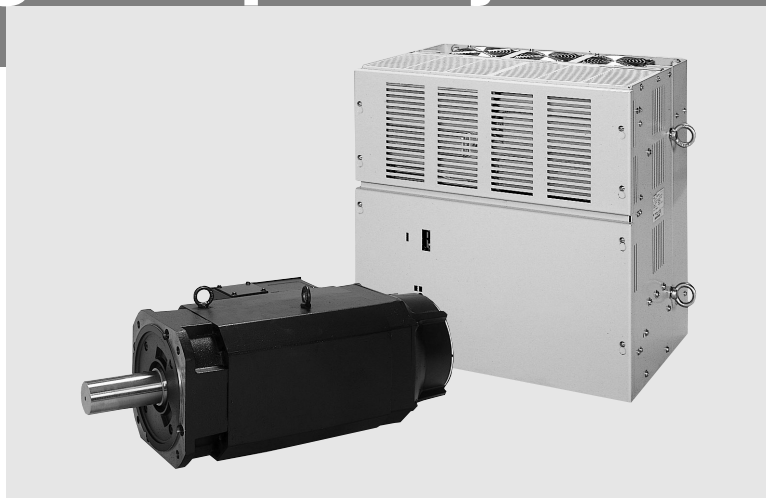
SGDH-@, SGMBH-@

Sigma-II Large Capacity



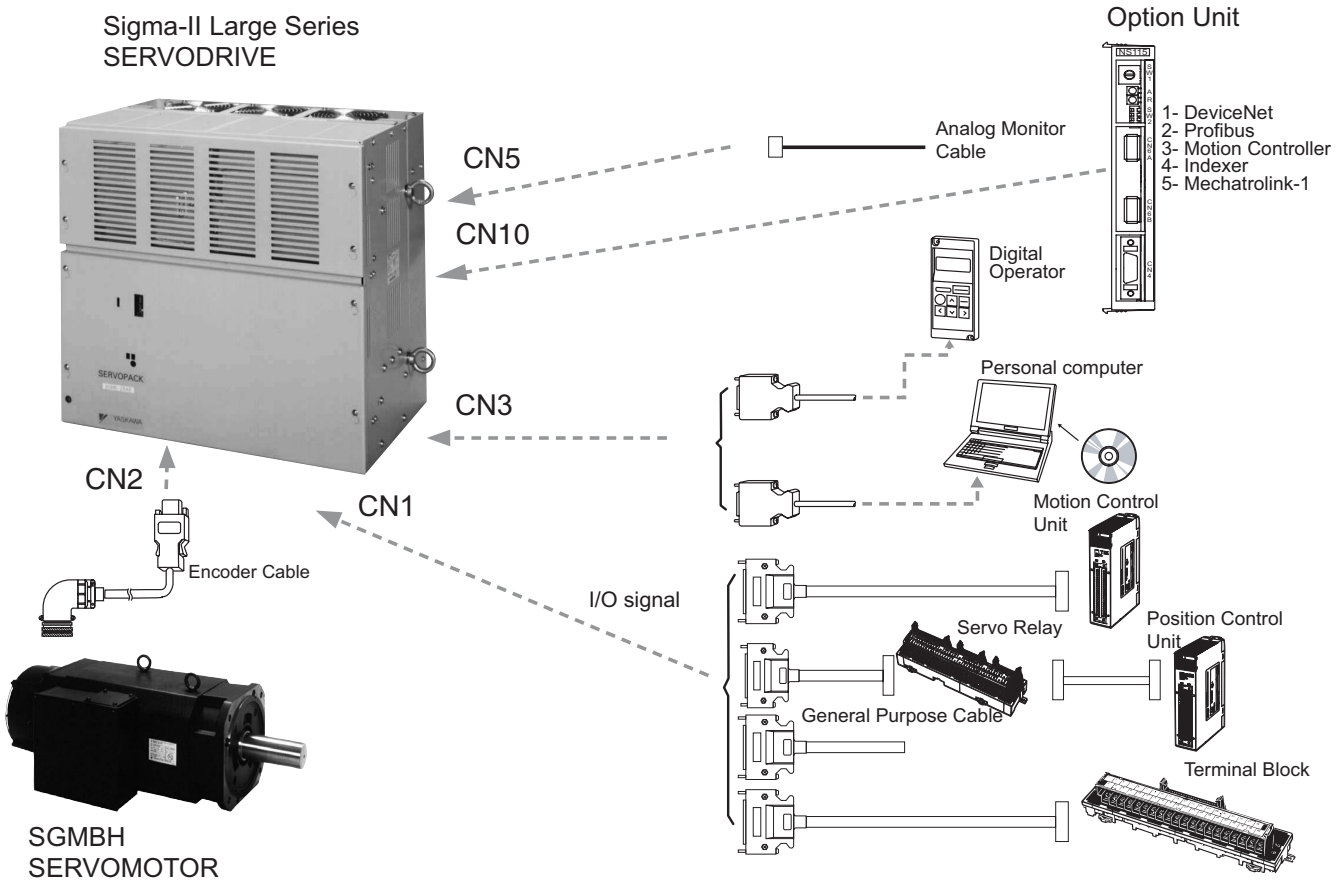
Large Capacity Sigma-II series. Great power a well as High Speed, and High Accuracy.

- Easy setup and maintenance
- Optional Units for system flexibility and connectivity
- Automatic motor recognition
- Analogue control for speed and torque
- Pulse train control for positioning
- Oscilloscope available via SigmaWin tool
- Windows based Configuration and commissioning software

Ratings

- 400VAC, 22 kW (140 Nm) to 55 kW (350 Nm)

System Configuration



Servomotor Specifications

Type Designation

S G M B H - 2 B D 2 A □ □

Sigma-II Series Large
Type : SGMBH

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

Voltage
D:400V

Encoder Specifications
2:17-bit (ABS) standard
C:17-bit (INC) standard
3: 20-bit (ABS) option

Design Revision
A:Standard

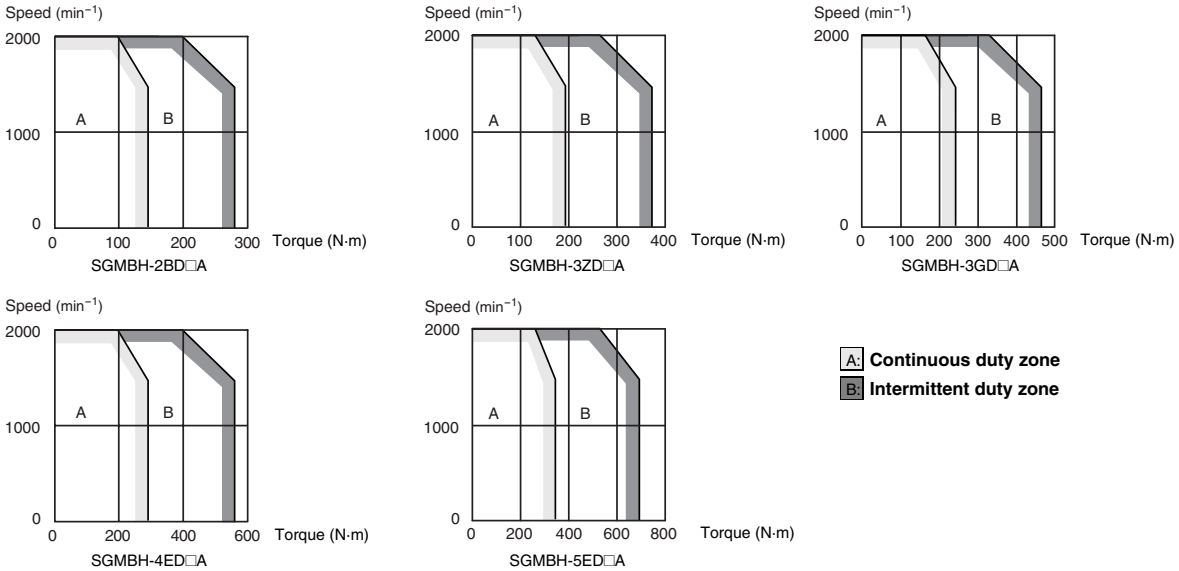
Option
1: Oil seal (V type)
B: Oil seal (V type) and holding brake (90VDC)
C: Oil seal (V type) and holding brake (24VDC)
S: Oil seal (S type)
D: Oil seal (S type) and holding brake (90VDC)
E: Oil seal (S type) and holding brake (24VDC)
Note : Options are not available for 55kW motors.

Motor Specifications
2 : Flange, straight shaft
6 : Flange, straight shaft
□ (with key and tap)
} For 45 kW or less
K : Foot mount, straight shaft
L : Foot mount, straight shaft
□ (with key and tap)
} For 37 kW or more

Type	SGMBH-□		2BD□A	3ZD□A	3GS□A	4ED□A	5ED□A
Performance	Rated Output	kW	22	30	37	45	55
	Rated Torque	N·m	140	191	236	286	350
	Stalling Torque	N·m	140	191	236	286	350
	Instantaneous Peak Torque	N·m	280	382	471	572	700
	Rated Current	A(rms)	58	80	100	127	150
	Innstantaneous Max. Current	A(rms)	120	170	210	260	310
	Rated/Max. Speed	min^{-1}	1500/2000				
	Rotor Inertia	$kg·m^2$	0.0592	0.0773	0.139	0.151	0.197
Structure	Protective Enclosure		IP44				
	Mounting Method		Flange		Flange Foot mount [1]		Foot mount
Encoder		Standard	Incremental, absolute: 17 bits 16384P/R or equivalent [2]				
		Option	Absolute: 20 bits 16384P/R or equivalent				
Usage Temperature			0 to 40°C				
Usage Humidity			20 to 80% (non-condensing)				

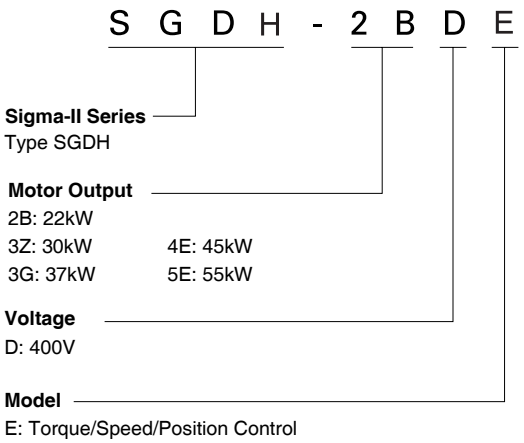
Note: 1. 37 kW and 45 kW motors with brakes are foot mount type
2. .The number of output pulses of SERVOPACK is 16384P/R for both 17-bit and 20-bit encoders (no dividing).

Torque/Speed Characteristics



Servo Drive Specifications

Type Designation



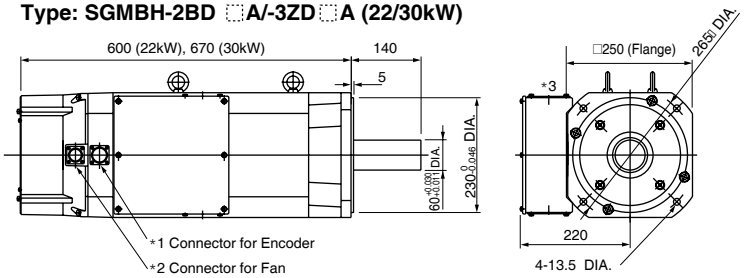
Type				SGDH-□	2BDE	3ZDE	3GDE	4EDE	5EDE
Applicable SERVOMOTOR Type				SGMBH-□	2BD□A	3ZD□A	3GD□A	4ED□A	5ED□A
Continuous Output				kW	22	30	37	45	55
Allowable Load Inertia				kg · m² x 10	0.296	0.3865	0.695	0.840	0.985
Basic Specifications	Power Supply	Main Circuit			Three-phase 380 to 480VAC/+10 to - 15%, 50/60Hz				
		Main Circuit Power Capacity kVA			36.7	50.1	61.8	75.2	91.9
		Control Circuit			24VDC±10%				
		Control Circuit Power Capacity			46W				
	Control method				Three-phase, full-wave rectification IGBT-PWM				
	Feedback				17-bit serical encoder (incremental/absolute)				
	Usage/Storage Temperature				SERVOPACK: 0 to 55°C / -20 to 85°C Digital operator: 0 to 55°C / -20 to 70°C				
	Usage/Storage Humidity				90%RH or less (non-condensing)				
	Control Method	Speed Control			±2 to ±10VDC at 155r/min				
		Torquer Control			±1 to ±10VDC at rated output				
		Position Control			Input form: Sign + pulse train, CD + CCW pulse train, 90° phase difference 2-phase pulse Input frequency: 500/200kpps (line driver/open collector output)				
	I/O Signals	Position Control	Output Form		Phase A, phase B, phase C: (line driver output)				
			Frequency Dividing Ratio		(16 to N) N: encoder pulse number				
		Sequence Input Signal			Servo ON, forward rotation prohibited (P-OT), reverse rotation prohibited (N-OT), forward rotation current limit, reverse rotation current limit, alarm reset, P control				
		Sequence Output Signal			Servo alarm, 3-bit alarm code				
					Select three signals from servo ready, current limit detection, TGON, positioning complete (speed agreement), brake release, overload, warning, overload detected				
Functions/Performance	Frequency Response				100Hz (motor inertia = load inertia)				
	DB				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-figure, 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				

Note: DB means an automatic dynamic brake, which operates at main power OFF, servo alarm, servo OFF, and overtravel.

Dimensions

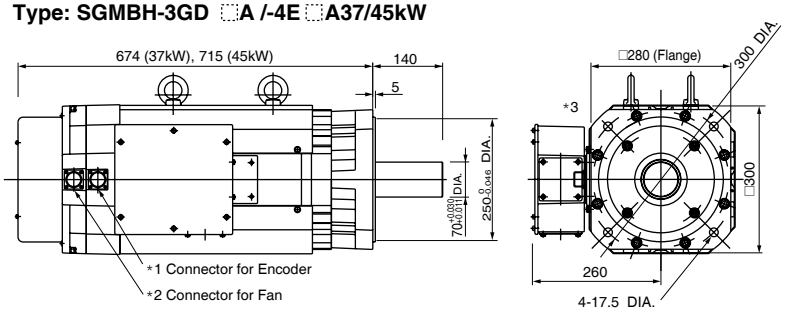
Servomotors

Type: SGMBH-2BD □A/-3ZD□A (22/30kW)



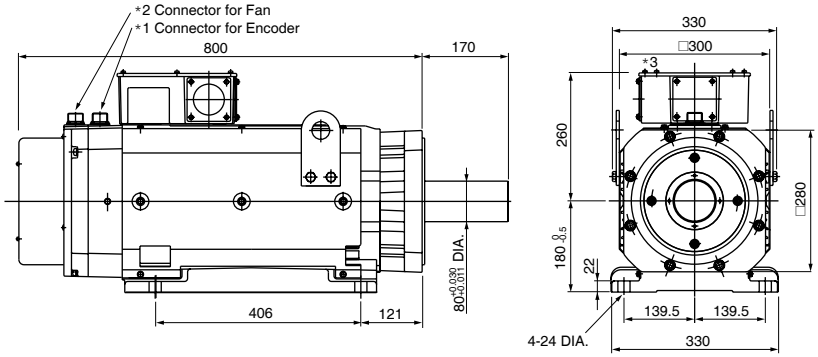
Approx. Mass:□120kg (22kW)
□ 140kg (30kW)

Type: SGMBH-3GD □A /-4E□A37/45kW



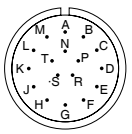
Approx. Mass:□230kg (37kW)
□ 250kg (45kW)

Type: SGMBH-5ED □A (55kW)



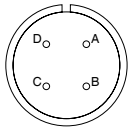
Approx. Mass: 350kg

***1 Connector for Encoder**



Receptacle: □□	97F-3102E20-29P
Plug IP67 (L-shape): □	MS3108E20-29S

***2 Connector for Fan**



Receptacle: □□	CE05-2A18-10PD-B
Plug IP67 (L-shape):□	MS3108E18-10S

● 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)		

● **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)		

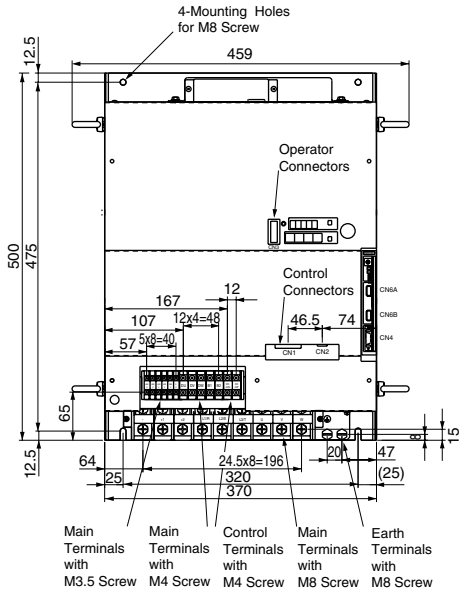
A	Fan Terminal (U)
B	Fan Terminal (V)
C	Fan Terminal (W)
D	

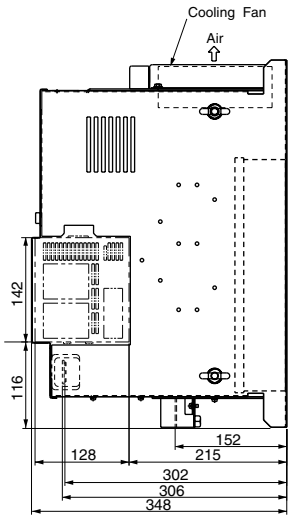
*3 Terminal Box

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

Servo Drives

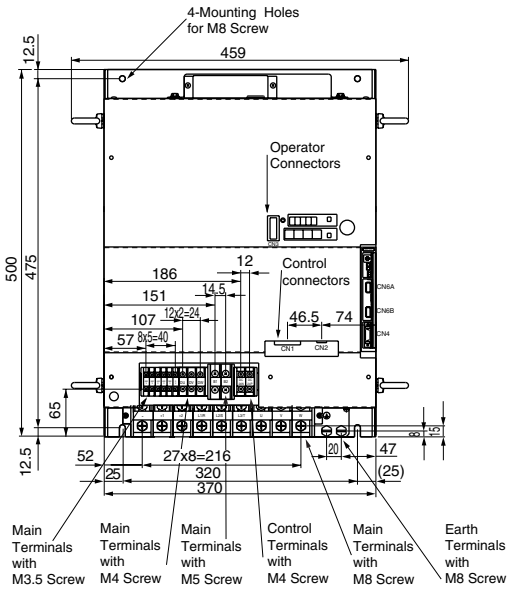
Type: SGDH-2BDE (22kW)

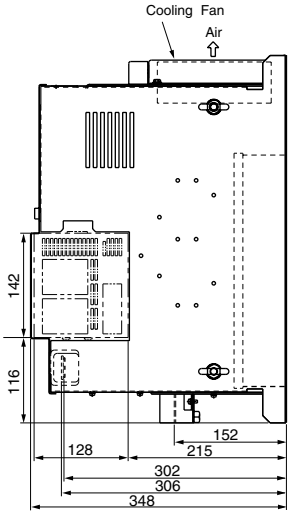




Approx. Mass: 40kg

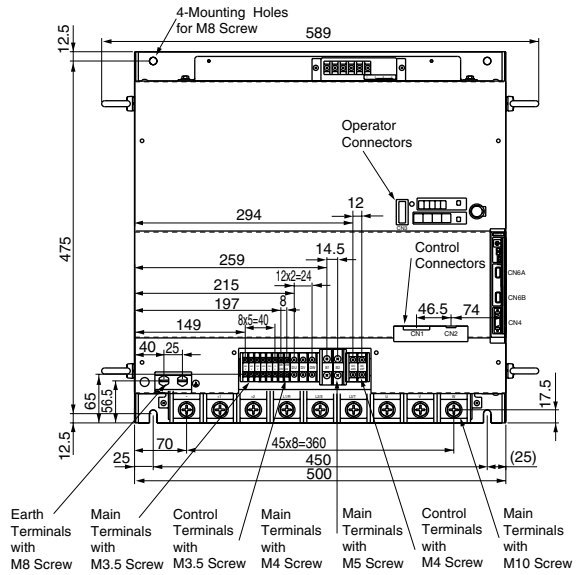
Type: SGDH-3ZDE (30kW)

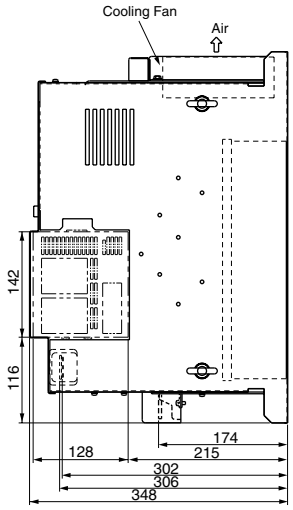




Approx. Mass: 40kg

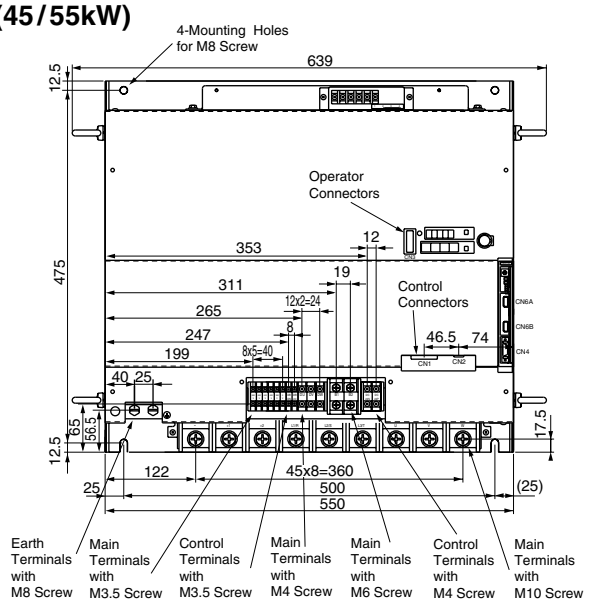
Type: SGDH-3GDE (37kW)

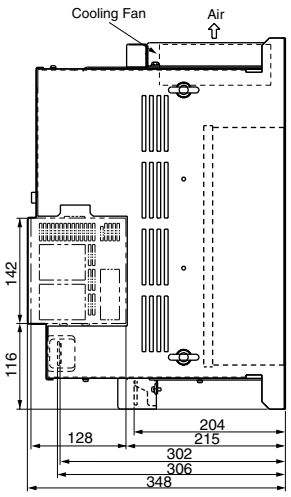




Approx. Mass: 60kg

Type: SGDH-4EDE/-5EDE (45/55kW)

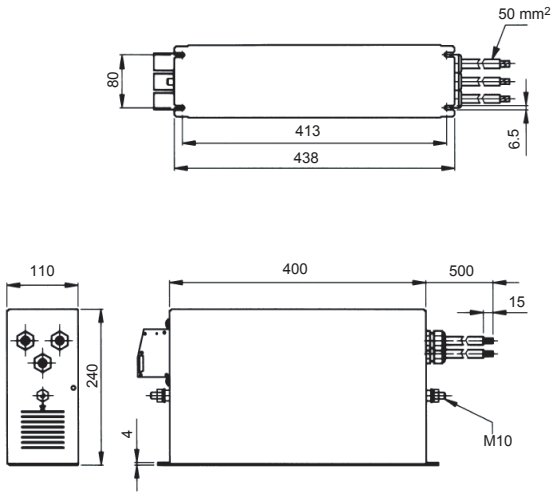




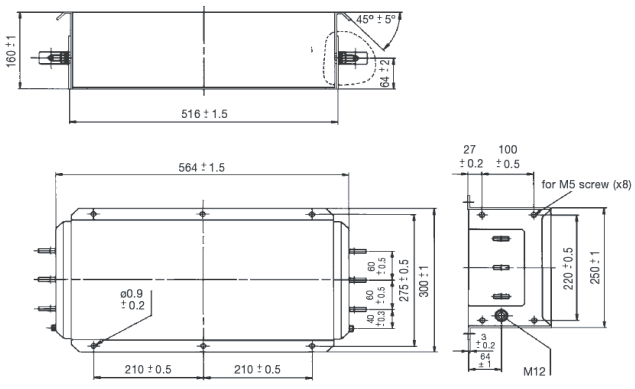
Approx. Mass: 65kg

Filters

FN258-180-07

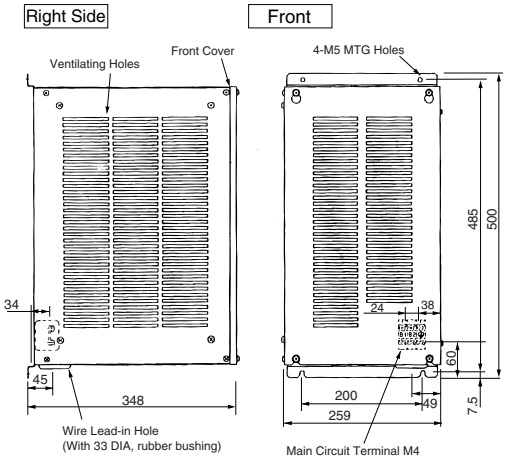


FN359-250-99



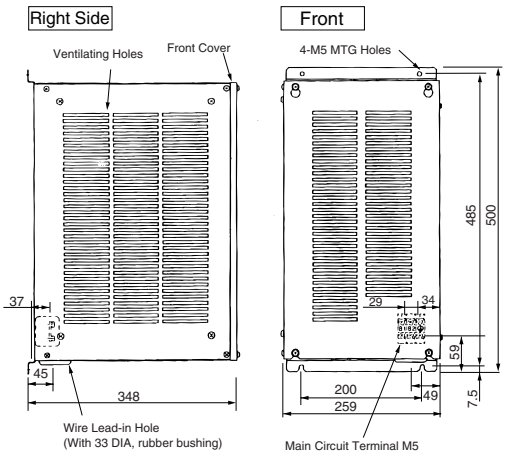
Regenerative Resistor Unit

Type: JUSP-RA12 (for 22kW)



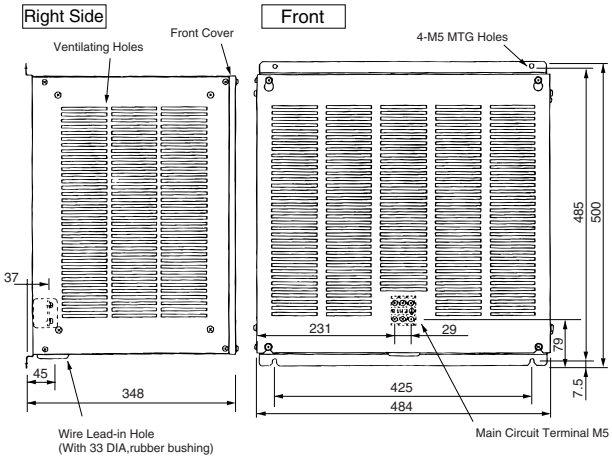
Approx. Mass: 14.0kg

Type: JUSP-RA13 (for 30kW)



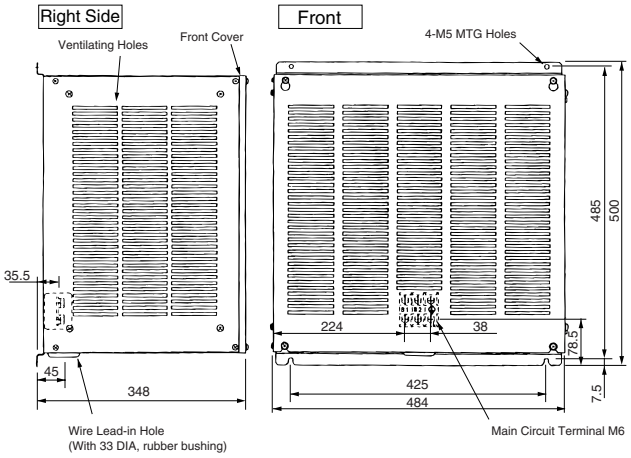
Approx. Mass: 14.0kg

Type: JUSP-RA14 (for 37kW)



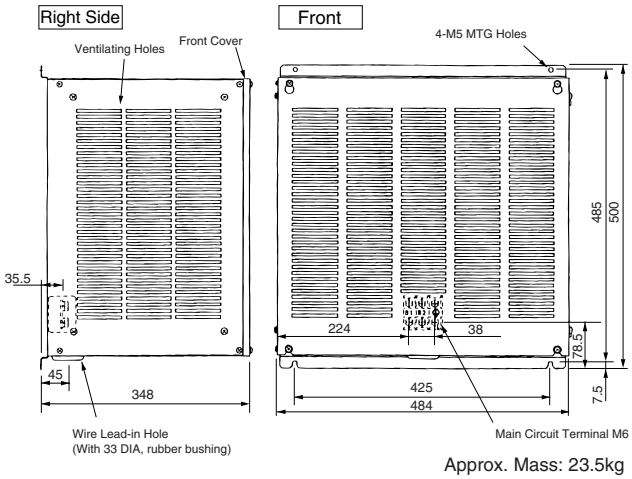
Approx. Mass: 20.0kg

Type: JUSP-RA15 for 45kW



Approx. Mass: 21.5kg

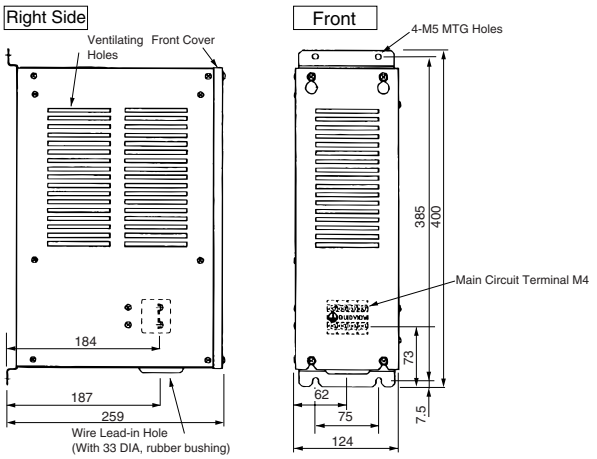
Type: JUSP-RA16 (for 55kW)



Approx. Mass: 23.5kg

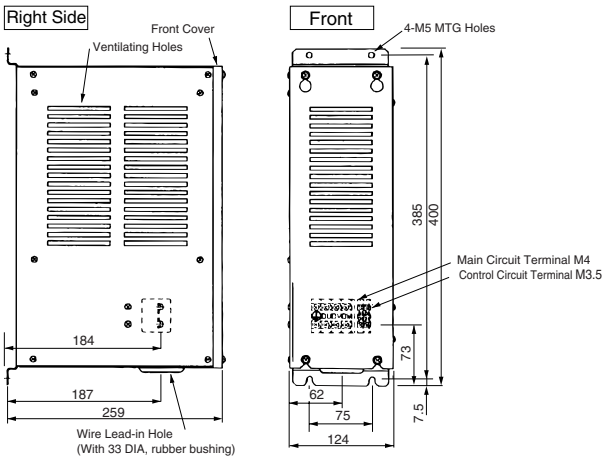
DB Resistor Unit

Type: JUSP-DB03 (for 22/30kW)



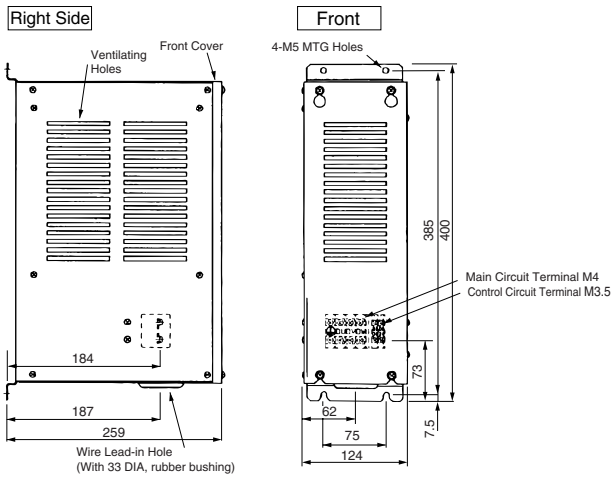
Approx. Mass: 5.0kg

Type: JUSP-DB04 (for 37kW)



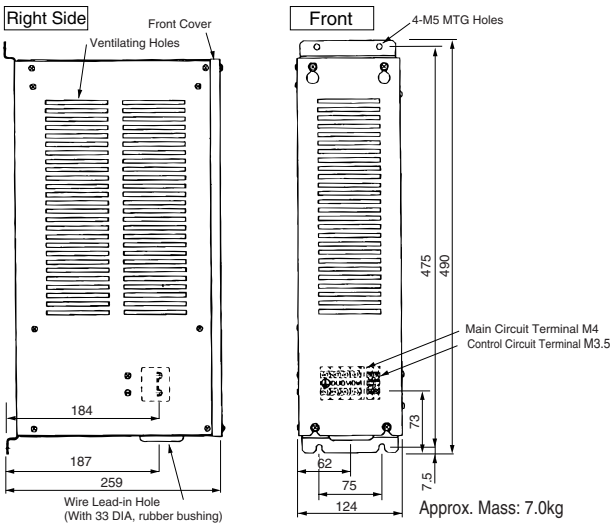
Approx. Mass: 6.0kg

Type: JUSP-DB05 (for 45kW)



Approx. Mass: 6.0kg

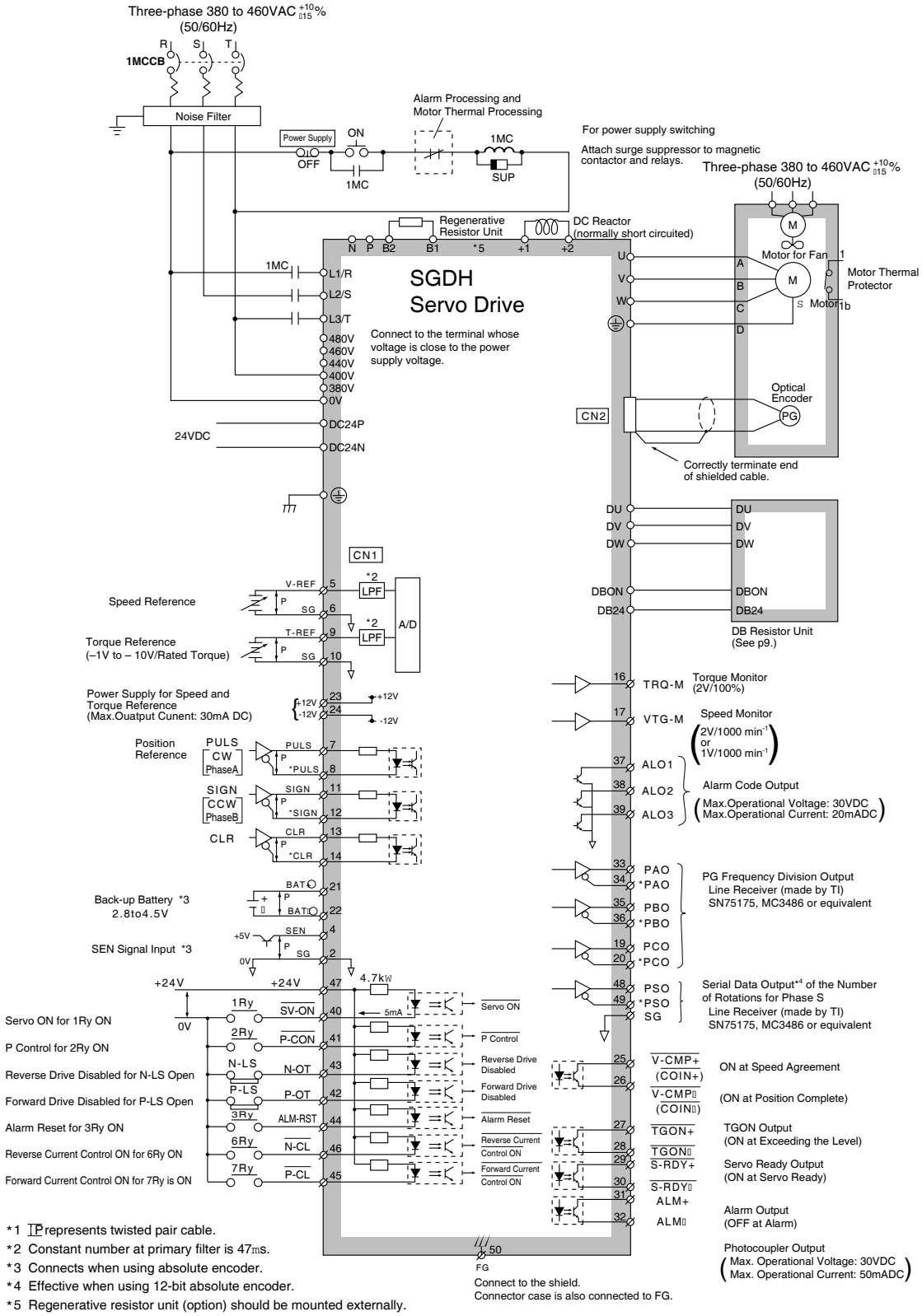
Type: JUSP-DB06 (for 55kW)



Approx. Mass: 7.0kg

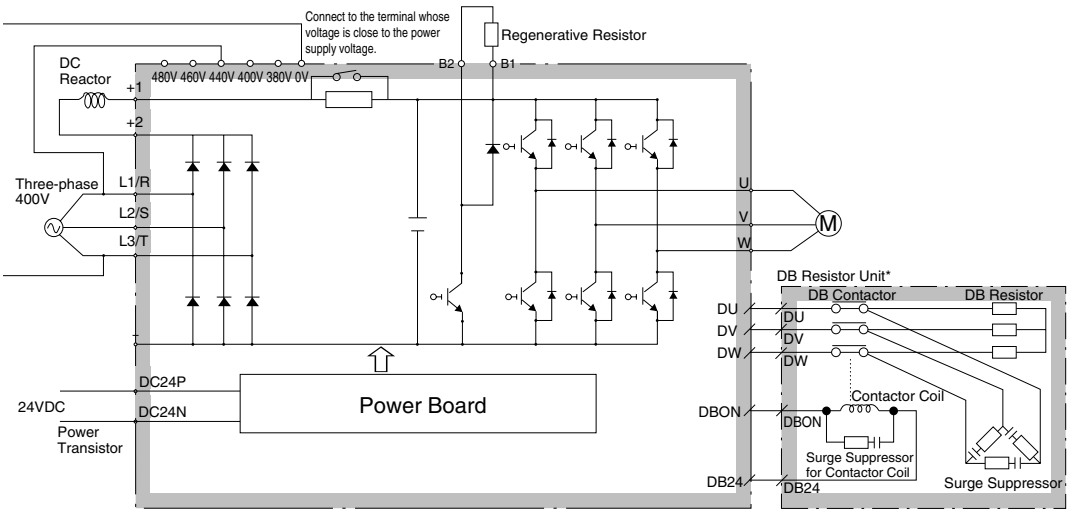
Installation

Standard Connections



*1 Represents twisted pair cable.
*2 Constant number at primary filter is 47ms.
*3 Connects when using absolute encoder.
*4 Effective when using 12-bit absolute encoder.
*5 Regenerative resistor unit (option) should be mounted externally.
*6 TI stands for Texas Instruments Inc.

Main Circuit Connection



* This diagram is an example of a DB resistor unit with a built-in DB contactor and a surge suppressor for 37 to 55kW. A unit for 22/30kW consists of the resistor only.

Main Circuit Terminal Description

Terminal Symbol	Name	Description	Terminal Symbol	Name	Description
L1/R, L2/S, L3/T	Main Circuit Power Supply Input Terminal	Three-phase 380 to 460 VAC, +10 to -15%, 50/60 Hz	B1, B2	Regenerative Resistor	Connects regenerative resistor
DC24P	Control Power Supply Input Terminal	24VDC	–	Main Circuit Negative Side Terminal	(Normally external connection is not necessary).
DC24N			DU, DV, DW	DB Resistor Unit, DB Contactor Connection Terminal	Connects DB resistor unit or DB contactor.
U, V, W	Motor Connection Terminal	Connect with motor	DBON, DB24	DB Resistor Unit Connection Terminal	For 37 to 55kW, connects to DBON and DB24 terminals or DB resistor unit.
⏚ (X2)	Earth Terminal	Grounded (for power supply earth and motor earth).	480V, 460V, 440 V, 400 V, 380 V, 0V	Control Power Supply Input Terminal	Connect to the terminal whose voltage is close to the power supply voltage.
+1, +2	DC Reactor Connection Terminal	Connect DC reactor for supressing high-harmonic wave. If not necassary, shorten the terminals.			

Control Circuit Terminal Description

CN1 (Connector I/O) Terminal Layout

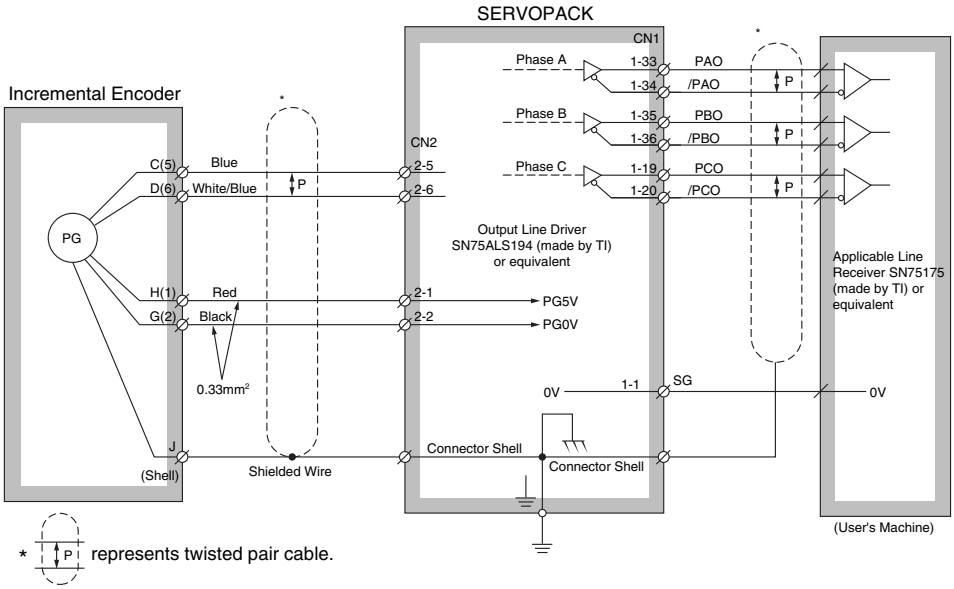
2	SG	GND	1	SG	GND	27	/TGON+	TGON output signal	26	/V-CMP (/COIN-)	Speed agreement signal output
4	SEN	SEN signal input	3	PL1	Power supply for open collector ref.	29	/S-RDY+	Servo ready output	28	/TGON-	TGON output signal
6	SG	GND	5	V-REF	Speed ref. input	31	ALM+	Servo alarm output	30	/S-RDY-	Servo ready output
8	/PULS	Ref. pulse input	7	PULS	Ref. pulse input	33	PAO	PG dividing output phase A	32	ALM-	Servo alarm output
10	SG	GND	9	T-REF	Torque ref. input	35	PBO	PG dividing output phase B	34	/PAO	PG dividing output phase A
12	/SIGN	Ref. code input	11	SIGN	Ref. code input	37	ALO1	Alarm code output	36	/PBO	PG dividing output phase B
14	/CLR	Clear input	13	PL2	Power Supply for open collector ref.	39	ALO3	(Open collector)	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 dividing output phase C	19	PCO	PG dividing 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

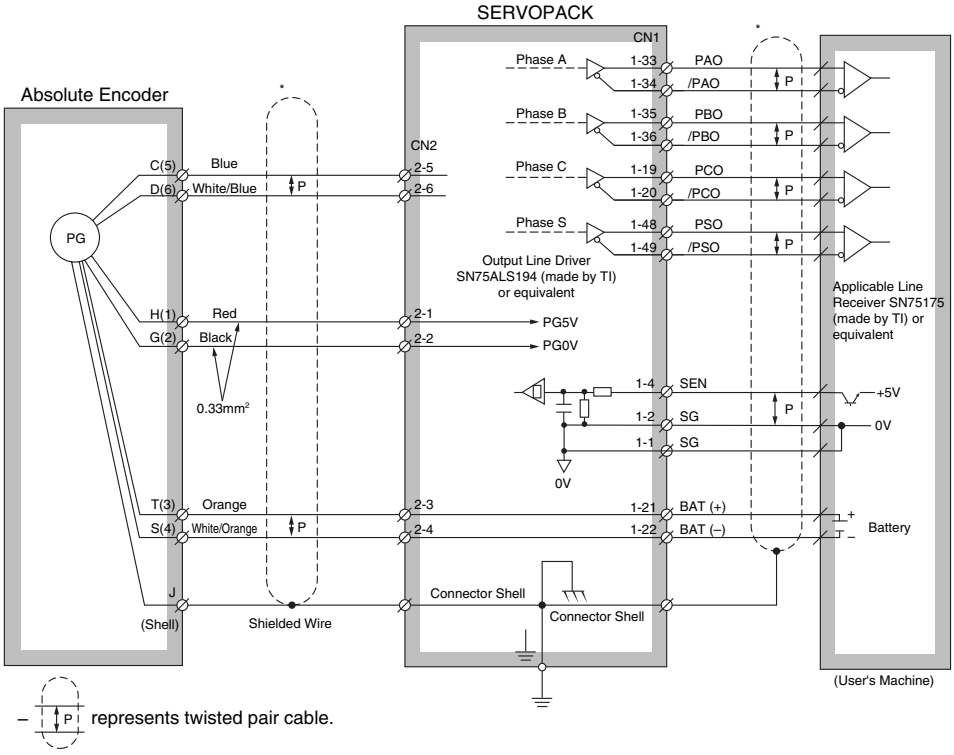
1	PG5V	PG power supply+5V	2	PG 0V	PG power supply 0V
3	BAT(+)	Battery(+) (absolute encoder only)	4	BAT(-)	Battery(-) (absolute encoder only)
5	PS	PG serial signal input	6	/PS	PG serial signal input

Encoder Connections

Incremental Encoder



Absolute Encoder

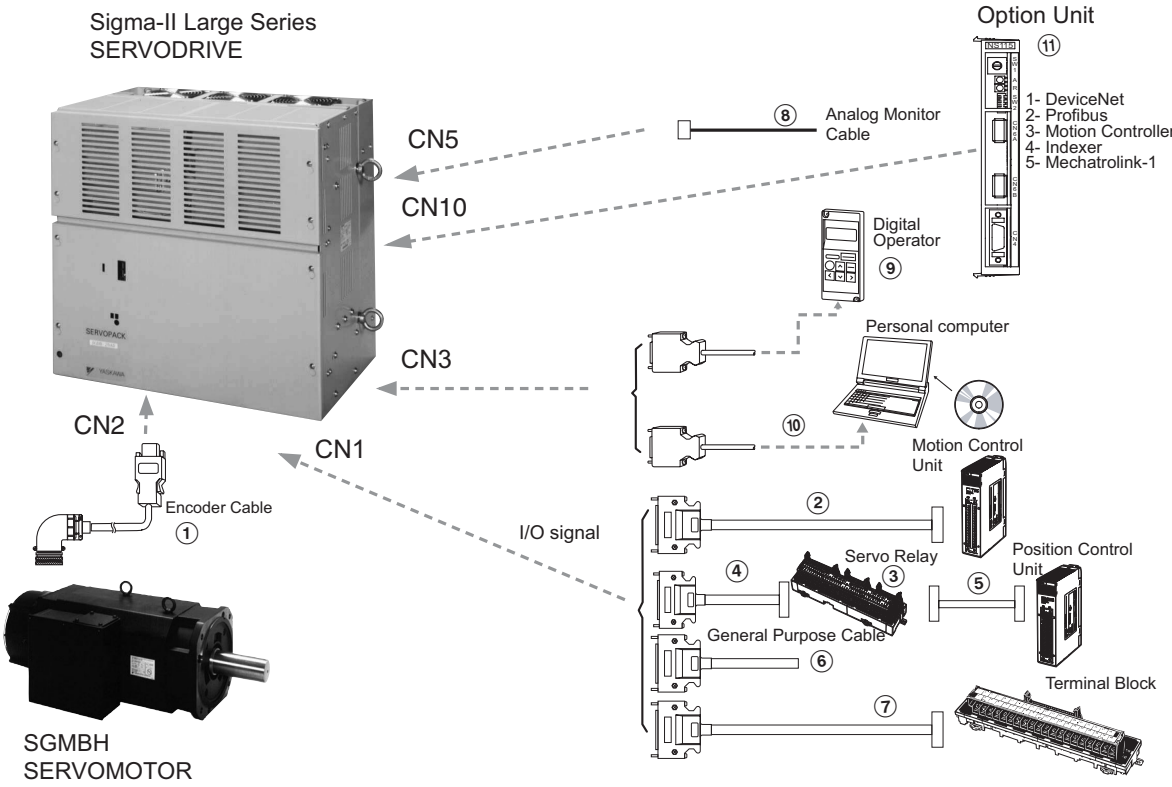


System Configuration Example

Large-capacity AC servo drive configurations are illustrated below.
Connectors and operators are not provided with servomotors and Servo Drives.
Order what you need separately.

Ordering Information

System Configuration



Servomotors

SGMBH - Servomotors 1500 r/min (22 - 55 kW)



Specifications				Model
Incremental Encoder (17 bit) Straight shaft with key & Tap	Without brake Flange Mount	140 Nm	22 kW	SGMBH-2BDCA61
		191 Nm	30 kW	SGMBH-3ZDCA61
		236 Nm	37 kW	SGMBH-3GDCA61
		286 Nm	45 kW	SGMBH-4EDCA61
	Without brake Foot mount	236 Nm	37 kW	SGMBH-3GDCAL1
		286 Nm	45 kW	SGMBH-4EDCAL1
		350 Nm	55 kW	SGMBH-5EDCAL1
	With brake Flange Mount	140 Nm	22 kW	SGMBH-2BDCA6C
		191 Nm	30 kW	SGMBH-3ZDCA6C
		236 Nm	37 kW	SGMBH-3GDCA6C
		286 Nm	45 kW	SGMBH-4EDCA6C
	With brake Foot mount	236 Nm	37 kW	SGMBH-3GDCALC
		286 Nm	45 kW	SGMBH-4EDCALC
Absolute Encoder (17 bit) Straight shaft with key & Tap	Without brake Flange Mount	140 Nm	22 kW	SGMBH-2BD2A61
		191 Nm	30 kW	SGMBH-3ZD2A61
		236 Nm	37 kW	SGMBH-3GD2A61
		286 Nm	45 kW	SGMBH-4ED2A61
	Without brake Foot mount	236 Nm	37 kW	SGMBH-3GD2AL1
		286 Nm	45 kW	SGMBH-4ED2AL1
		350 Nm	55 kW	SGMBH-5ED2AL1
	With brake Flange Mount	140 Nm	22 kW	SGMBH-2BD2A6C
		191 Nm	30 kW	SGMBH-3ZD2A6C
		236 Nm	37 kW	SGMBH-3GD2A6C
		286 Nm	45 kW	SGMBH-4ED2A6C
	With brake Foot mount	236 Nm	37 kW	SGMBH-3GD2ALC
		286 Nm	45 kW	SGMBH-4ED2ALC

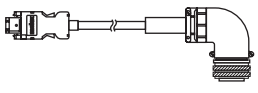
Servo Drives

SGDH - Servo Drives (22 - 55 kW)



Specifications		Model	Compatible Servomotors
3 Phase 400 V AC	22.0 kW	SGDH-2BDE	SGMBH-2BD@
	30.0 kW	SGDH-3ZDE	SGMBH-3ZD@
	37.0 kW	SGDH-3GDE	SGMBH-3GD@
	45.0 kW	SGDH-4EDE	SGMBH-4ED@
	55.0 kW	SGDH-5EDE	SGMBH-5ED@

Encoder Cables (for CN2)



Symbol	Specifications		Model
①	Encoder cable (for motors SGMBH-@)	3 m	R88A-CRWB003N-E
		5 m	R88A-CRWB005N-E
		10 m	R88A-CRWB010N-E
		15 m	R88A-CRWB015N-E
		20 m	R88A-CRWB020N-E

Control Cables (for CN1)

Symbol	Description	Connect to		Model
②	Control Cable (1 Axis)	Motion Control Units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M1
			2 m	R88A-CPW002M1
			3 m	R88A-CPW003M1
			5 m	R88A-CPW005M1
	Control Cable (2 Axis)	Motion Control Units CS1W-MC221 CS1W-MC421 C200H-MC221	1 m	R88A-CPW001M2
			2 m	R88A-CPW002M2
			3 m	R88A-CPW003M2
			5 m	R88A-CPW005M2
	Terminal Block (4 Axes)	Motion Control Unit C200HW-MC402-E	-	R88A-TC04-E
	Servodrive connecting Cable (1 Axis)		1 M	R88A-CMUK001J3-E2
	PLC Unit Control Cables (4 Axes)		1 m	R88A-CMX001S-E
			1 m	R88A-CMX001J1-E
③	Servo Relay Unit	CS1W-NC1@3, CJ1W-NC1@3, or C200HW-NC113 Position Control Unit		XW2B-20J6-1B (1 axis)
		CS1W-NC2@3/4@3, CJ1W-NC2@3/4@3, or C200HW-NC213/413 Position Control Unit		XW2B-40J6-2B (2 axes)
		CQM1H-PLB21 CQM1-CPU43		XW2B-20J6-3B (1 axis)
		CJ1M-CPU22/23		XW2B-20J6-8A (1 axis) XW2B-40J6-9A (2 axes)
④	Cable to Servo drive	Servo Relay Units XW2B-@0J6-@B	1 m	XW2Z-100J-B4
			2 m	XW2Z-200J-B4
⑤	Position Control Unit Connecting Cable	C200H-NC112	0.5 m	XW2Z-050J-A1
			1 m	XW2Z-100J-A1
		C200H-NC211	0.5 m	XW2Z-050J-A2
			1 m	XW2Z-100J-A2
		CQM1-CPU43-V1 and CQM1H-PLB21	0.5 m	XW2Z-050J-A3
			1 m	XW2Z-100J-A3
		CS1W-NC113 and C200HW-NC113	0.5 m	XW2Z-050J-A6
			1 m	XW2Z-100J-A6
		CS1W-NC213/413 and C200HW-NC213/413	0.5 m	XW2Z-050J-A7
			1 m	XW2Z-100J-A7
		CS1W-NC133	0.5 m	XW2Z-050J-A10
			1 m	XW2Z-100J-A10
		CS1W-NC233/433	0.5 m	XW2Z-050J-A11
			1 m	XW2Z-100J-A11
		CJ1W-NC113	0.5 m	XW2Z-050J-A14
			1 m	XW2Z-100J-A14
		CJ1W-NC213/413	0.5 m	XW2Z-050J-A15
			1 m	XW2Z-100J-A15
		CJ1W-NC133	0.5 m	XW2Z-050J-A18
			1 m	XW2Z-100J-A18
		CJ1W-NC233/433	0.5 m	XW2Z-050J-A19
			1 m	XW2Z-100J-A19
		CJ1M-CPU22/23	0.5 m	XW2Z-050J-A27
			1 m	XW2Z-100J-A27
⑥	Control Cable	For General purpose Controllers	1 m	R88A-CPW001S or JZSP-CKI01-1
			2 m	R88A-CPW002S or JZSP-CKI01-1
⑦	Relay Terminal Block Cable	General-purpose Controller	1 m	R88A-CTW001N
			2 m	R88A-CTW002N
	Relay Terminal Block		-	XW2B-50G5

Battery Backup for absolute encoder

Name	Model
Battery (Required for servomotors with absolute encoder)	JZSP-BA01 or ER6VC3 (3.6V)

Cable (for CN5)

Symbol	Name	Model
⑧	Analog Monitor Cable	R88A-CMW001S or DE9404559

Options (for CN3)

Symbol	Name	Model
⑨	Parameter Unit with Cable	JUSP-OP02A-2 or R88A-PR02W
⑩	Computer Connecting Cable	R88A-CCW002P2 or JZSP-CMS02

Option Units (for CN10)

Symbol	Name	Model
⑪	1.5 axis Advanced Motion Controller with Host Link Interface	R88A-MCW151-E
	1.5 axis Advanced Motion Controller with DeviceNet Interface	R88A-MCW151-DRT-E
	Mechatrolink-I Interface unit	JUSP-NS100
	DeviceNet Interface unit with Positioning Fuctionality	JUSP-NS300
	PROFIBUS-DP Interface unit with Positioning Fuctionality	JUSP-NS500
	Indexer Unit. Versatile Point to Point Positioning	JUSP-NS600

Connectors

Specification	Model
Control I/O connector (For CN1)	R88A-CNU11C or JZSP-CKI9
Sigma-II Drive Encoder connector (For CN2)	JZSP-CMP9-1
Military Connector for Encoder, IP67 (For Motors SGMBH-@)	MS3108E20-29S
Military Connector for Fan, IP67 (For Motors SGMBH-@)	MS3108E18-10S

Filters

Specifications (applicable Servo Drive)	Model	Rated Current
SGDH-2BDE, SGDH-3ZDE, SGDH-3GDE	FN258-180-07	180 A
SGDH-4EDE, SGDH-5EDE	FN359-250-99	250 A

Regenerative Resistor Units

Servo Drive Model	Regenerative Resistor Unit Model	Specifications
SGDH-2BDE	JUSP-RA12	9Ω , 3600 W
SGDH-3ZDE	JUSP-RA13	6.7Ω , 3600 W
SGDH-3GDE	JUSP-RA14	5Ω , 4800 W
SGDH-4EDE	JUSP-RA15	4Ω , 6000 W
SGDH-5EDE	JUSP-RA16	3.8Ω , 7200 W

DB Resitor units

Servo Drive Model	Regenerative Resistor Unit Model	Specifications. Star Wiring
SGDH-2BDE, SGDH-3ZDE	JUSP-DB03	180 W, 0.8Ω
SGDH-3GDE	JUSP-DB04	180 W, 0.8Ω
SGDH-4EDE	JUSP-DB05	180 W, 0.8Ω
SGDH-5EDE	JUSP-DB06	300 W, 0.8Ω

Computer Software

Specifications	Model
SigmaWin	MOTION TOOLS CD