

XD-□, XD-□-E

XtraDrive

Intelligent servo drive. Integrated controller and network connectivity.

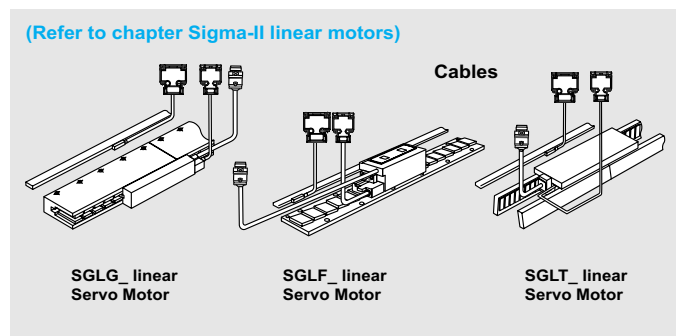
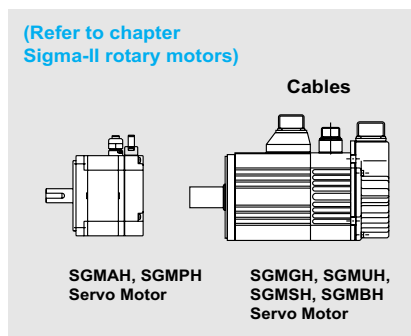
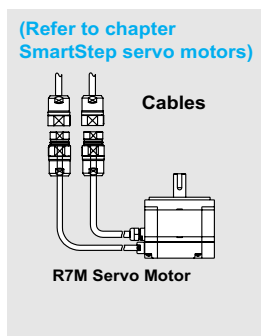
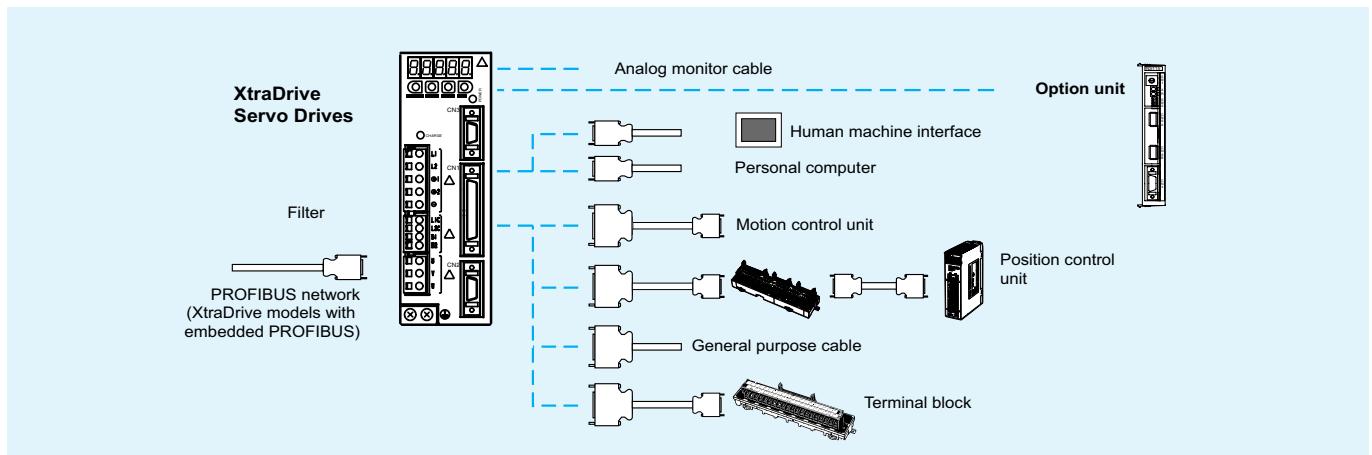
- NCT. Patented non-linear algorithm for tight control
- Very low tracking error with no overshoot and zero settling time
- Supports different servo motor encoder types
- PROFIBUS embedded in the drive available
- XtraDrive model available with electronic CAM
- The ideal drive for linear motor control
- Fast hardware registration input
- Intuitive text programming language
- Automatic tuning of servo parameters for optimal settling time
- Oscilloscope available via XtraWare software tool
- CompoWay/F is supported, it allows remote access to the drives through the PLC

Ratings











- 230 VAC single-phase 30 W to 1.5 kW (4.77 Nm)
- 400 VAC three-phase 0.5 kW to 5.0 kW (28.4 Nm)



System configuration



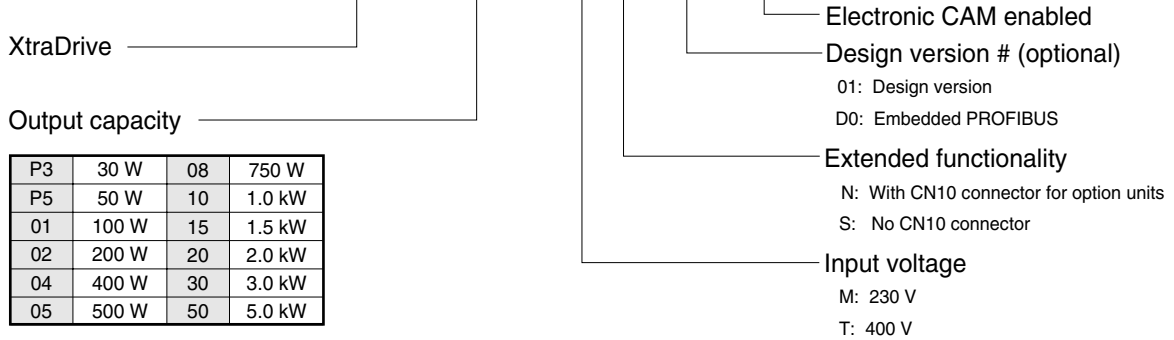
Servo motor / servo drive combination

Servo motor				Servo drive			
	Voltage	Rated torque	Capacity	230 V (1-phase)	230 V (1-phase) w PROFIBUS	400 V (3-phase)	400 V (3-phase) w PROFIBUS
Sigma-II series motors (refer to the Sigma-II rotary motors chapter for details)							
 SGMAH (3000 min ⁻¹)	230 V	0.0955 N.m	30 W	XD-P3-MN01-□	XD-P3-MSD0-□	-	-
		0.159 N.m	50 W	XD-P5-MN01-□	XD-P5-MSD0-□	-	-
		0.318 N.m	100 W	XD-01-MN01-□	XD-01-MSD0-□	-	-
		0.637 N.m	200 W	XD-02-MN01-□	XD-02-MSD0-□	-	-
		1.27 N.m	400 W	XD-04-MN01-□	XD-04-MSD0-□	-	-
		2.39 N.m	750 W	XD-08-MN□	XD-08-MSD0-□	-	-
	400 V	0.955 N.m	300 W	-	-	XD-05-TN□	XD-05-TSD0-□
		2.07 N.m	650 W	-	-	XD-10-TN□	XD-10-TSD0-□
 SGMPH (3000 min ⁻¹)	230 V	0.318 N.m	100 W	XD-01-MN01-□	XD-01-MSD0-□	-	-
		0.637 N.m	200 W	XD-02-MN01-□	XD-02-MSD0-□	-	-
		1.27 N.m	400 W	XD-04-MN01-□	XD-04-MSD0-□	-	-
		2.39 N.m	750 W	XD-08-MN□-□	XD-08-MSD0-□	-	-
		4.77 N.m	1500 W	XD-15-MN□-□	-	-	-
	400 V	0.637 N.m	200 W	-	-	XD-05-TN□	XD-05-TSD0-□
		1.27 N.m	400 W	-	-	XD-05-TN□	XD-05-TSD0-□
 SGMGH (1500 min ⁻¹)	400 V	2.84 N.m	0.45 kW	-	-	XD-05-TN□	XD-05-TSD0-□
		5.39 N.m	0.85 kW	-	-	XD-10-TN□	XD-10-TSD0-□
		8.34 N.m	1.3 kW	-	-	XD-15-TN□	XD-15-TSD0-□
		11.5 N.m	1.8 kW	-	-	XD-20-TN□	XD-20-TSD0-□
		18.6 N.m	2.9 kW	-	-	XD-30-TN□	XD-30-TSD0-□
		28.4 N.m	4.4 kW	-	-	XD-50-TN□	-
 SGMSH (3000 min ⁻¹)	400 V	3.18 N.m	1.0 kW	-	-	XD-10-TN□	XD-10-TSD0-□
		4.90 N.m	1.5 kW	-	-	XD-15-TN□	XD-15-TSD0-□
		6.36 N.m	2.0 kW	-	-	XD-20-TN□	XD-20-TSD0-□
		9.80 N.m	3.0 kW	-	-	XD-30-TN□	XD-30-TSD0-□
		12.6 N.m	4.0 kW	-	-	XD-50-TN□	-
		15.8 N.m	5.0 kW	-	-	XD-50-TN□	-
 SGMUH (6000 min ⁻¹)	400 V	1.59 N.m	1.0 kW	-	-	XD-10-TN□	XD-10-TSD0-□
		2.45 N.m	1.5 kW	-	-	XD-15-TN□	XD-15-TSD0-□
		4.9 N.m	3.0 kW	-	-	XD-30-TN□	XD-30-TSD0-□
		6.3 N.m	4.0 kW	-	-	XD-50-TN□	-
SmartStep series motors (refer to the SmartStep servo motors chapter for details)							
 R7M-A (3000 min ⁻¹)	230 V	0.0955 N.m	30 W	XD-P3-MN01-□	-	-	-
		0.159 N.m	50 W	XD-P5-MN01-□	-	-	-
		0.318 N.m	100 W	XD-01-MN01-□	XD-01-MSD0-□	-	-
		0.637 N.m	200 W	XD-02-MN01-□	XD-02-MSD0-□	-	-
		1.27 N.m	400 W	XD-04-MN01-□	XD-04-MSD0-□	-	-
		2.39 N.m	750 W	XD-08-MN□	XD-08-MSD0-□	-	-
 R7M-AP (3000 min ⁻¹)	230 V	0.318 N.m	100 W	XD-01-MN01-□	XD-01-MSD0-□	-	-
		0.637 N.m	200 W	XD-02-MN01-□	XD-02-MSD0-□	-	-
		1.27 N.m	400 W	XD-04-MN01-□	XD-04-MSD0-□	-	-
		2.39 N.m	750 W	XD-08-MN□	XD-08-MSD0-□	-	-
Sigma linear motors (refer to the Sigma linear motors chapter for details)							
 SGLGW Linear motors	230 V	Refer to the linear motors chapter for details					
 SGLFW Linear motors	230 V, 400 V	Refer to the linear motors chapter for details					
 SGLTW Linear motors	400 V	Refer to the linear motors chapter for details					

Type designation

Drive

XD - 01 - MN 01-E



Servo drive specifications

Single-phase, 230 V

Servo drive type		XD-P3-M□	XD-P5-M□	XD-01-M□	XD-02-M□	XD-04-M□	XD-08-M□	XD-15-M□
Applicable servo motor	SGMAH-□	A3A□	A5A□	01A□	02A□	04A□	08A□	15A□
	SGMPH-□	-	-	01A□	02A□	04A□	08A□	-
	R7M-□	A03030-□	A05030-□	A10030-□	A20030-□	A40030-□	A75030-□	-
	R7M-□	-	-	AP10030-□	AP20030-□	AP40030-□	AP75030-□	-
Max. applicable motor capacity	W	30	50	100	200	400	750	1500
Continuous output current	Arms	0.44	0.64	0.91	2.1	2.8	5.7	11.6
Max. output current	Arms	1.3	2.0	2.8	6.5	8.5	13.9	28
Input power	Main circuit	For single-phase, 200 to 230 VAC + 10 to -15%						
Supply	Control circuit	For single-phase, 200 to 230 VAC + 10 to -15%						
Control method		Single phase full-wave rectification / IGBT / PWM / sine-wave current drive method						
Feedback		Serial encoder (incremental/absolute value)						
Conditions	Usage/storage temperature	0 to +55 °C / -20 to 85 °C						
	Usage/storage humidity	90%RH or less (non-condensing)						
	Altitude	1000 m or less above sea level						
	Vibration/shock resistance	4.9 m/s ² / 19.6 m/s ²						
Configuration		Base mounted						
Approx. weight	Kg	0.8			1.1		1.7	3.8

Three-phase, 400 V

Servo drive type		XD-05-T□	XD-10-T□	XD-15-T□	XD-20-T□	XD-30-T□	XD-50-T□
Applicable servo motor	SGMAH-□	03D□	07D□	-	-	-	-
	SGMPH-□	02D□, 04D□	08D□	15D□	-	-	-
	SGMGH-□	05D□	09D□	13D□	20D□	30D□	44D□
	SGMSH-□	-	10D□	15D□	20D□	30D□	40D□/50D□
	SGMUH-□	-	10D□	15D□	-	30D□	40D□
Max. applicable motor capacity	kW	0.45	1.0	1.5	2.0	3.0	5.0
Continuous output current	Arms	1.9	3.5	5.4	8.4	11.9	16.5
Max. output current	Arms	5.5	8.5	14	20	28	40.5
Input power	Main circuit	For three-phase, 380 to 480 VAC + 10 to -15% (50/60 Hz)					
Supply	Control circuit	24 VDC+15%					
Control method		Three phase full-wave rectification / IGBT / PWM / sine-wave current drive method					
Feedback		Serial encoder (incremental/absolute value)					
Conditions	Usage/storage temperature	0 to +55 °C / -20 to +85 °C					
	Usage/storage humidity	90%RH or less (non condensing)					
	Altitude	1000 m or less above sea level					
	Vibration/shock resistance	4.9 m/s ² / 19.6 m/s ²					
Configuration		Base mounted					
Approx. weight	Kg	2.8			3.8		5.5

General specifications

Speed/torque control mode	Performance	Speed control range	1:5000	
		Speed variance	Load variance	During 0 to 100% load $\pm 0.01\%$ max. (at rated speed)
			Voltage variance	Rated voltage $\pm 10\%$: 0% (at rated speed)
			Temperature variance	25 \pm 25 °C: $\pm 0.1\%$ max (at rated speed)
		Frequency characteristics	400Hz (at $J_L = J_M$)	
	Torque control accuracy (reproducibility)	$\pm 2\%$		
	Soft start time setting	0 to 10s (acceleration, deceleration can each be set.)		
	Input signal	Speed reference input	Reference voltage	± 6 VDC (forward motor rotation if positive reference) at rated speed: Set at delivery Variable setting range: ± 2 to ± 10 VDC at rated speed/ max. input voltage: ± 12 V
			Input impedance	Approx. 14 k Ω
			Circuit time constant	-
Torque reference input		Reference voltage	± 3 VDC (forward rotation if positive reference) at rated speed: Set at delivery Variable setting range ± 1 to ± 10 VDC at rated torque reference	
		Input impedance	Approx. 14 K Ω	
		Circuit time constant	Approx. 47 μ s	
Contact speed reference	Rotation direction selection	With P control signal		
	Speed selection	With forward/reverse current limit signal (speed 1 to 3 selection), servo motor stops or another control method is used when both are OFF.		
Position control mode	Performance	Bias Setting	0 to 450 min ⁻¹ (setting resolution: 1 min ⁻¹)	
		Feed forward compensation	0 to 100 % (setting resolution: 1%)	
		Position completed width setting	0 to 250 command units (setting resolution: 1 command unit)	
	Input signal	Command pulse	Input pulse type	Sign + pulse train, 90° phase displacement 2-phase pulse (A-phase+ B-phase) or CCW/CW pulse train
			Input pulse form	Line driver (+5 V level) , open collector (+5 V or +12 level)
			Input pulse frequency	0 to 500 Kpps (200 Kpps max. at open collector)
		Control signal	Clear signal (input pulse is same as reference pulse)	
	I/O signal	Position signal output	A-phase, B.phase, C-phase, (S-phase): line driver output S-phase is for absolute encoder only.	
		Sequence input signal	Servo ON, P control (or control mode switching, zero clamp, command pulse inhibit), forward/reverse run prohibit, alarm reset, forward/ reverse current limit (or internal speed switching)	
		Sequence output signal	Servo alarm, alarm codes (3-bit output): CN1 output terminal is fixed It is possible to output three types of signals form among: positioning complete (speed agree), motor rotation, servo ready, current limit, speed limit, brake release, warning, NEAR, and zero point pulse signal	
Integrated functions	Communications	Interface	Digital operator (hand- held type), RS-422 port for PCs, etc. (RS-232C ports under some conditions)	
		1:N communications	N may equal up to 14 when an RS-422A port is used. CompoWay/F protocol is supported on firmware version "3.20C" and higher	
		Axis address setting	Set by user setting	
		Functions	Status display, user constant setting monitor display, alarm traceback display, JOG run /autotuning operations, and graphing functions for speed/torque command signal, etc	
	PROFIBUS	(Only models with PROFIBUS) PROFIBUS DP slave, node address 0-125 set by rotary switches, baud rate from 9.6 kbps to 12 Mbps. LED Indicators: Bus failure and system failure		
	Auto tuning function	Position speed loop gain and integral time constant can be automatically set.		
	Dynamic brake (DB)	Operates during main power OFF, servo alarm, servo OFF or overtravel		
	Regenerative processing	Regenerative resistor externally mounted (option)		
	Overtravel (OT) prevention function	DB stop, deceleration stop or coast to stop during P-OT, N-OT operation		
	Encoder divider function	Optional division possible		
	Electronic gearing	0,01< A/B<100		
	Internal speed setting function	3 speeds may be set internally		
	Protective functions	Overcurrent, overvoltage, insufficient voltage, overload, main circuit sensor error, heatsink overheat, power phase loss, overflow, overspeed, encoder error, runaway, CPU error, parameter error, etc.		
	Analog monitor functions for supervision	Integrates analog monitor connectors for supervision of the speed and torque reference signals, etc.		
	Display functions	CHARGE, POWER, 7-segments LEDx5 (Integrated digital operator function, not available in models with PROFIBUS)		
Others	Reverse connection, zero search, automatic motor discrimination function, and DC reactor connection terminal for high frequency power suppression function (except: 6 to 15 kW)			

I/O specifications

Terminal specifications

Symbol	Name	Function
L1, L2 or L1, L2, L3	Main circuit AC input terminal	AC power input terminals for the main circuit
U	Servo motor connection terminal	Red
V		White
W		Blue
L1C, L2C	Control power input terminal	AC power input terminals for the control circuit.
⊖	Frame ground	Ground terminal. Ground to a maximum of 100 Ω . (class 3)
B1, B2 or B1, B2, B3	Main circuit DC output terminal	5 kW or less: Connect an external regenerative resistor if regenerative energy is high. 5.5 kW: There is no internal regenerative resistor. Be sure to connect an external regenerative resistor unit.
⊕1, ⊕2	DC reactor connection terminal for suppressing power supply harmonic waves	Normally, short ⊕1 and ⊕2. If a countermeasure against power supply harmonic waves is needed, connect a DC reactor between ⊕1 and ⊕2.
⊕	Main circuit DC output terminal (+)	Normally, not connected. This terminal exists on the servo drives with a capacity of 6.0 kW or higher only.
⊖	Main circuit DC output terminal (-)	Normally, not connected.

Encoder connector (CN2)

Pin	Symbol	Function
1, 2, 3	PPG0V	Encoder power supply GND
4, 5, 6	PPG5V	Encoder power supply +5 V
7	-	-
8	PS+	Encoder serial signal input
9	PS-	Encoder serial signal input
10	SePG5V	Serial encoder power supply +5 V (Sigma-II)
11	SePG0V	Serial encoder power supply GND (Sigma-II)
12	BAT+	Battery + (used only with absolute encoder)
13	BAT-	Battery - (used only with absolute encoder)
14	PC+	Encoder + C-phase input
15	PC-	Encoder - C-phase input
16	A+	Encoder + A-phase input
17	A-	Encoder - A-phase input
18	B+	Encoder + B-phase input
19	B-	Encoder - B-phase input
20	-	-
Shell	FG	Cable shield ground

I/O signals (CN1) - input signals

Pin No.	Signal Name	Function		
40	Common	/S-ON Servo ON: Turns ON the servo motor when the gate block in the inverter is released.		
41	/P-CON	Function selected by parameter.		
		Proportional control reference	Switches the speed control loop from PI (proportional/ integral) to P (proportional) control when ON.	
		Direction reference	With the internal set speed selected: switch the rotation direction.	
		Control mode switching	Position ↔ speed Position ↔ torque Torque ↔ speed } Enables control mode switching.	
		Zero-clamp reference	Speed control with zero-clamp function: reference speed is zero when ON.	
		Reference pulse block	Position control with reference pulse stop: stops reference pulse input when ON.	
42	P-OT	Forward run prohibited		
43	N-OT	Reverse run prohibited		
45	/P-CL /N-CL	Function selected by parameter.		
46		Forward external torque limit ON	Current limit function enabled when ON.	
		Reverse external torque limit ON		
		Internal speed switching	With the internal set speed selected: switches the internal speed settings.	
44	/ALM-RST	Alarm reset: releases the servo alarm state.		
47	+24VIN	Control power supply input for sequence signals: users must provide the +24 V power supply. Allowable voltage fluctuation range: 11 to 25 V		
4 (2)	SEN	Initial data request signal when using an absolute encoder.		
21	BAT (+)	Connecting pin for the absolute encoder backup battery.		
22	BAT (-)	Do not connect when a battery is connected to the host controller.		
5 (6)	Speed	V-REF Speed reference speed input: ±2 to ±10 V/rated motor speed (input gain can be modified using a parameter.)		
9 (10)	Torque	T-REF Torque reference input: ±1 to ±10 V/rated motor torque (input gain can be modified using a parameter.)		
7	Position	PULS /PULS SIGN /SIGN	Reference pulse input for line driver only	Input mode is set from the following pulses. Sign + pulse string CCW/CW pulse Two-phase pulse (90° phase differential)
8				
11				
12				
15	CLR /CLR		Positional error pulse clear input: clears the positional error pulse during position control.	
14				
3	PL1 PL2 PL3		+12 V pull-up power is supplied when PULS, SIGN, and CLR reference signals are open-collector outputs (+12 V power supply is built into the SERVOPACK).	
13				
18				

Note: 1. Pin numbers in parentheses () indicate signal grounds.

2. The functions allocated to /S-ON, /P-CON, P-OT, N-OT, /ALM-RST, /P-CL, and /N-CL input signals can be changed by using the parameters.

3. The voltage input range for speed and torque references is a maximum of ±12 V.

I/O signals (CN1) - output signals

Pin No.	Signal name	Function		
31 32	Common	ALM+ ALM-	Servo alarm: Turns OFF when an error is detected.	
27 28		/TGON+ /TGON-	Detection during servo motor rotation: detects when the servo motor is rotating at a speed higher than the motor speed setting. Detection speed can be set by using the parameters.	
29 30		/S-RDY+ /S-RDY-	Servo ready: ON if there is no servo alarm when the control/main circuit power supply is turned ON.	
33 (1) 34		PAO /PAO	Phase-A signal Converted two-phase pulse (phases A and B) encoder output signal and zero-point pulse (phase C) signal: RS-422 or the equivalent (proper line receiver is SN75175 manufactured by Texas Instruments or the equivalent corresponding to MC3486.)	
35 36		PBO /PBO		
19 20		PCO /PCO		
48 49		PSO /PSO	Phase-S signal With an absolute encoder: Outputs serial data corresponding to the number of revolutions (RS-422 or the equivalent)	
37 38 39 (1)		ALO1 ALO2 ALO3	Alarm code output: Outputs 3-bit alarm codes. Open-collector: 30 V and 20 mA rating maximum	
16		TMON	Analog monitor signal	
17		VTG	Analog monitor signal	
Shell		FG	Connected to frame ground if the shield wire of the I/O signal cable is connected to the connector shell.	
25 26		Speed	/V-CMP+ /V-CMP-	Speed coincidence (output in speed control mode): Detects whether the motor speed is within the setting range and if it matches the reference speed value.
25 26			/COIN+ /COIN-	Positioning completed (output in position control mode): Turns ON when the number of positional error pulses reaches the value set. The setting is the number of positional error pulses set in reference units (input pulse units defined by the electronic gear).
-	Reserved	/CLT /VLT /BK /WARN /NEAR	Reserved terminals The functions allocated to /TGON, /S-RDY, and /V-CMP (/COIN) can be changed by using the parameters. /CLT, /VLT, /BK, /WARN, and /NEAR signals can also be changed.	
23 24 50		-	Terminals not used Do not connect relays to these terminals.	

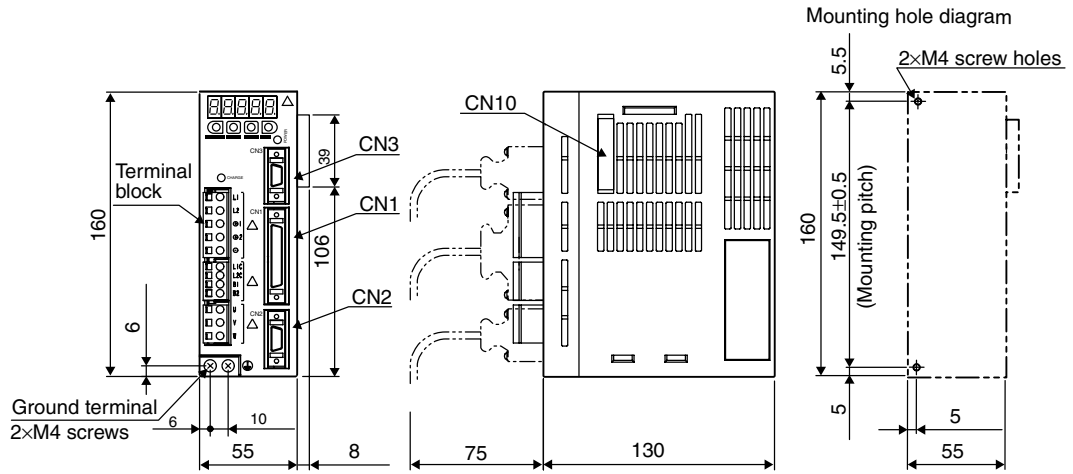
Note: 1. Pin numbers in parentheses () indicate signal grounds.

2. The functions allocated to /TGON, /S-RDY, and /V-CMP (/COIN) can be changed by using the parameters. /CLT, /VLT, /BK, /WARN, and /NEAR signals can also be changed.

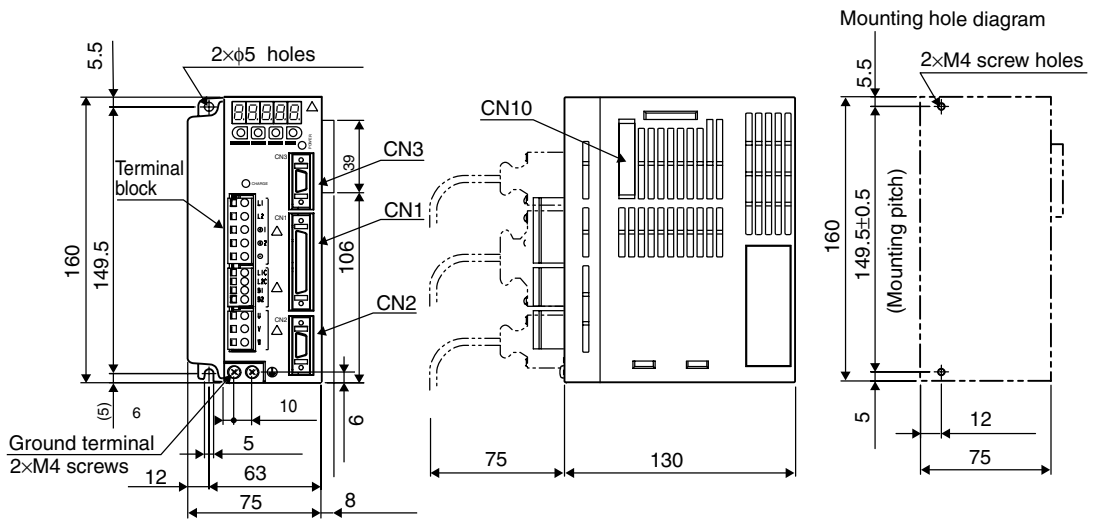
Dimensions

Servo drives

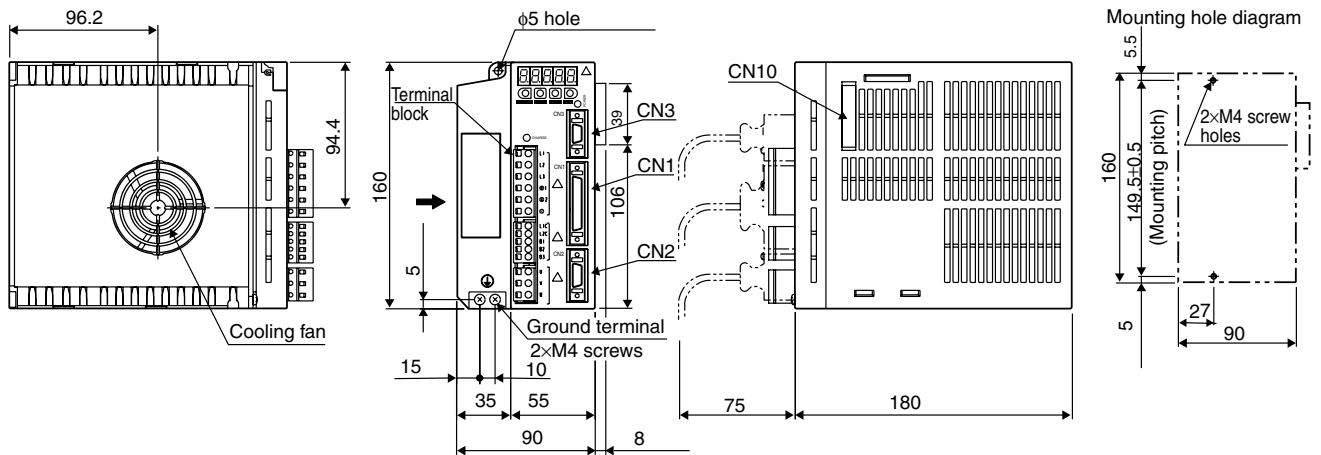
XD-P3-M□ to XD-02-M□ (230V, 30 to 200W)



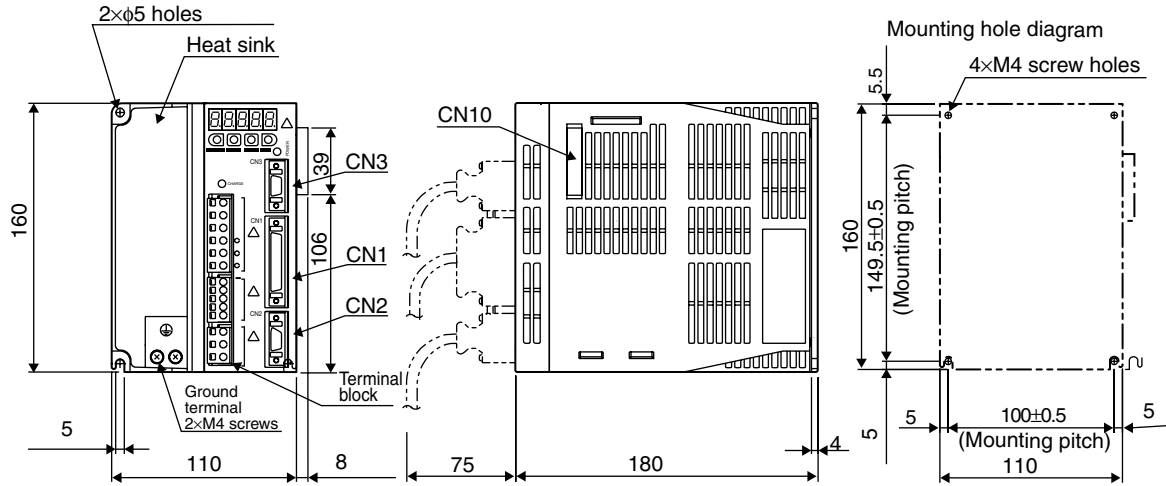
XD-04-M□ (230V, 400W)



XD-08-M□ (230V, 750W)

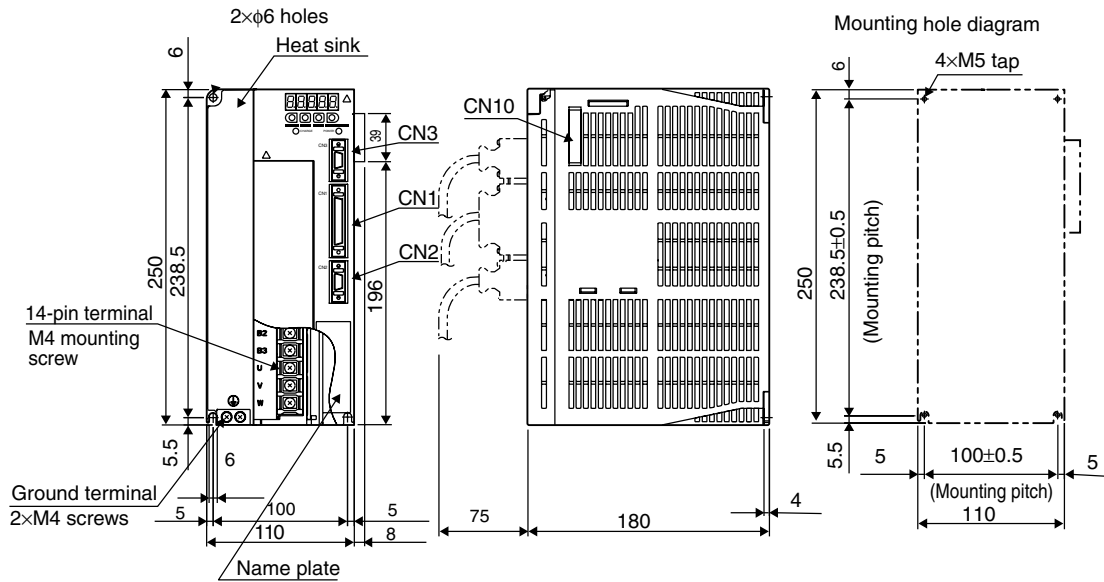


XD-05-T□ to -15-T□ (400V, 0.5 to 1.5kW)

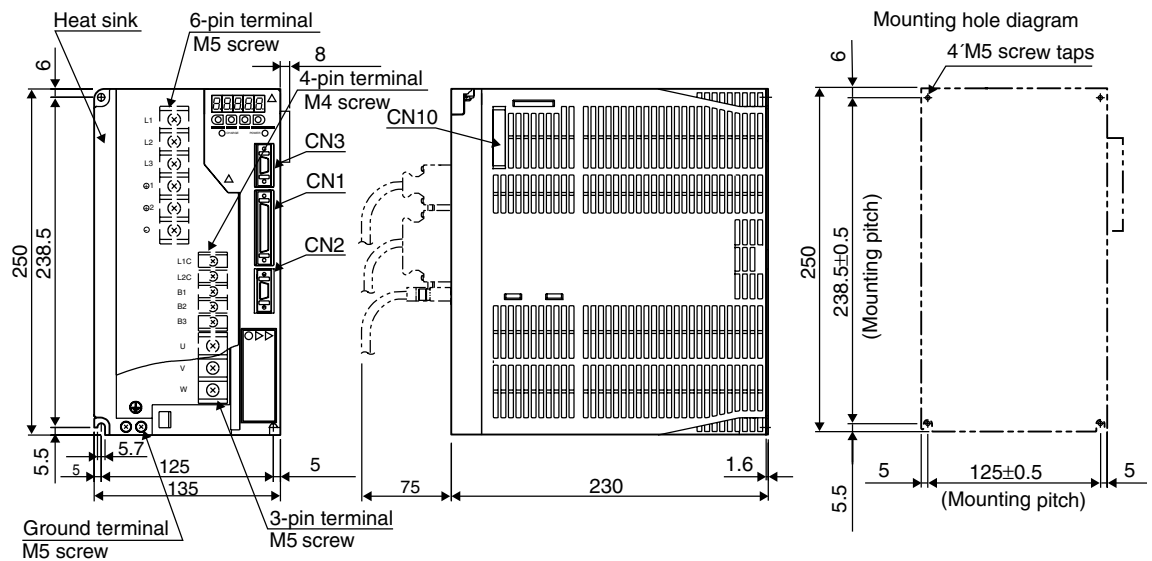


XD-15-M□ (230V, 1.5kW)

XD-20-T□, XD-30-T□ (400V, 2/3kW)

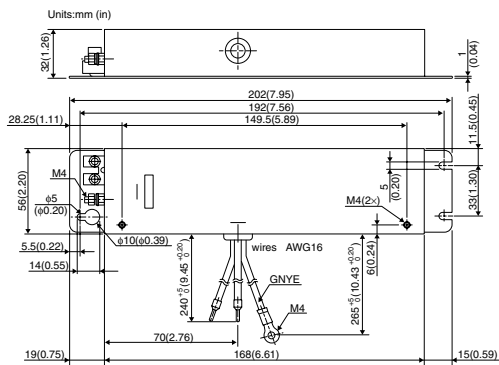


XD-50-T□ (400V, 5kW)



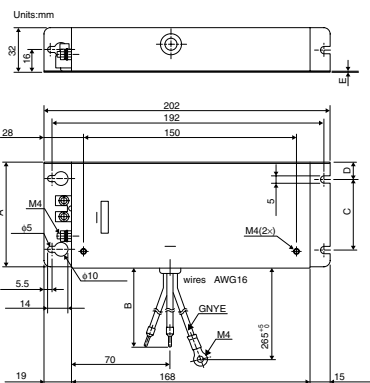
Filters

R88A-FIW104-SE



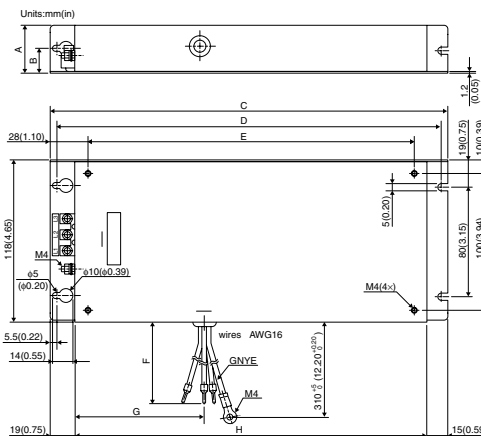
R88A-FIW107-SE, R88A-FIW115-SE

Model	R88A-FIW107-SE	R88A-FIW115-SE
Dimensions in mm		
A	75	90
B	240 ⁺⁵	300 ⁺⁵
C	50	60
D	12	15
E	1	1.2

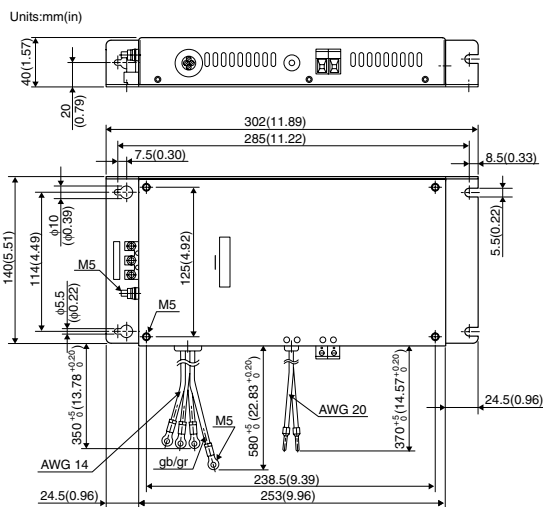


R88A-FIW4006-SE, R88A-FIW4010-SE

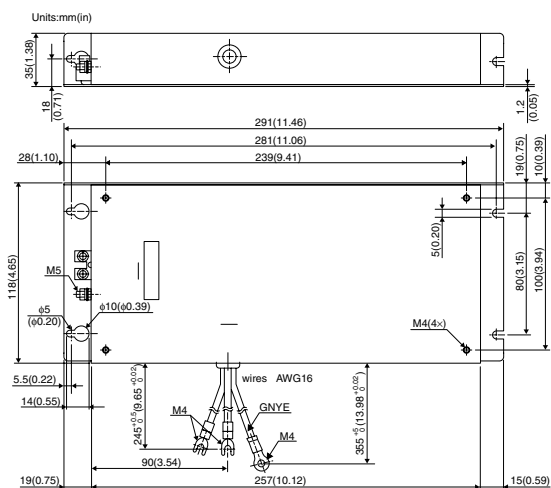
Model	R88A-FIW4006-SE	R88A-FIW4010-SE
Dimensions in mm (in)		
A	32 (1.26)	35 (1.38)
B	16 (0.63)	18 (0.71)
C	202 (7.95)	291 (11.46)
D	192 (7.56)	281 (11.06)
E	150 (5.91)	239 (9.41)
F	300 (11.81)	270 (10.63)
G	70 (2.76)	90 (3.54)
H	168 (6.61)	257 (10.12)



R88A-FIW4020-SE

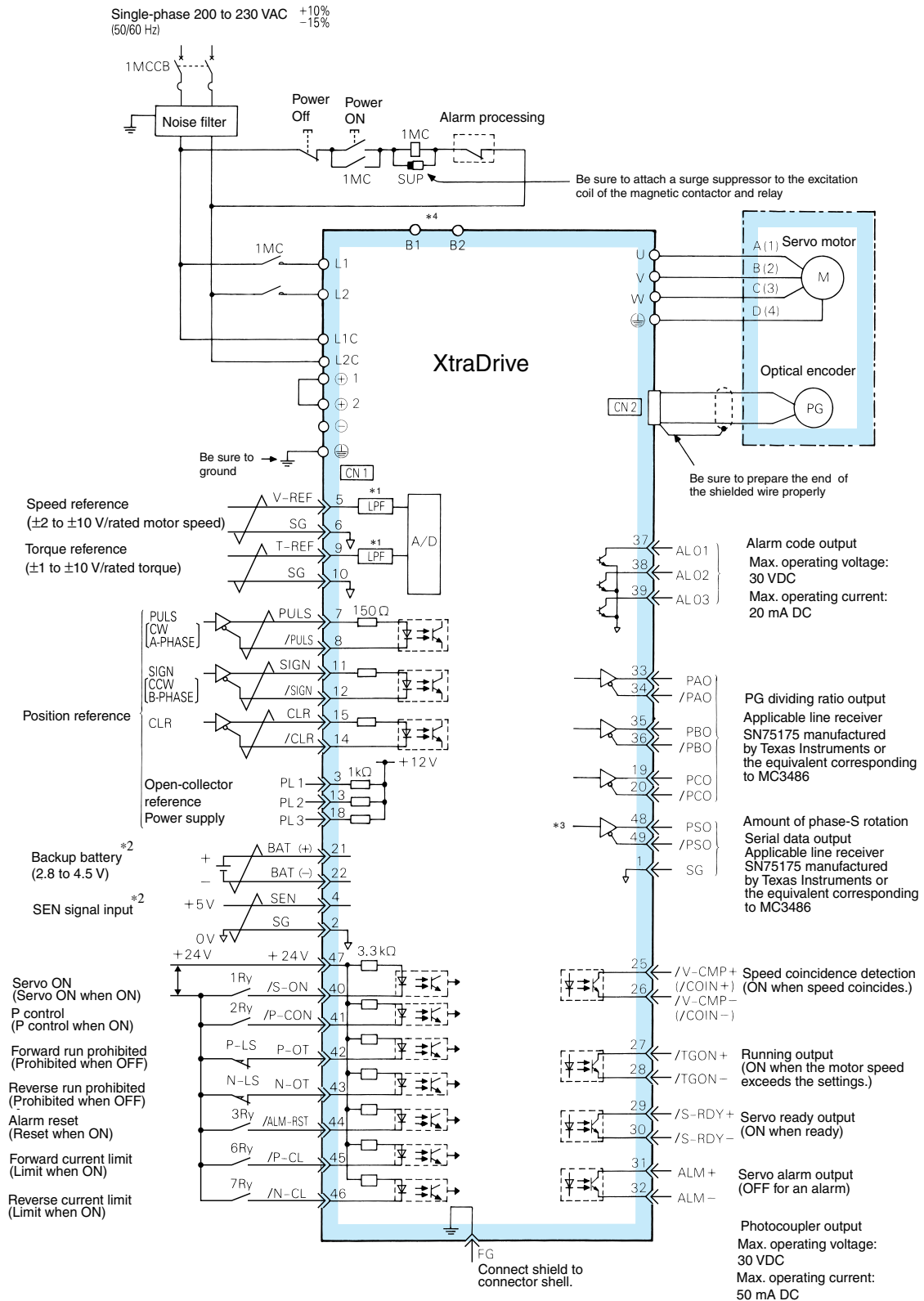


R88A-FIW125-SE



Installation

Single-phase, 230 VAC



*1 The time constant for the primary filter is 47 μ s.

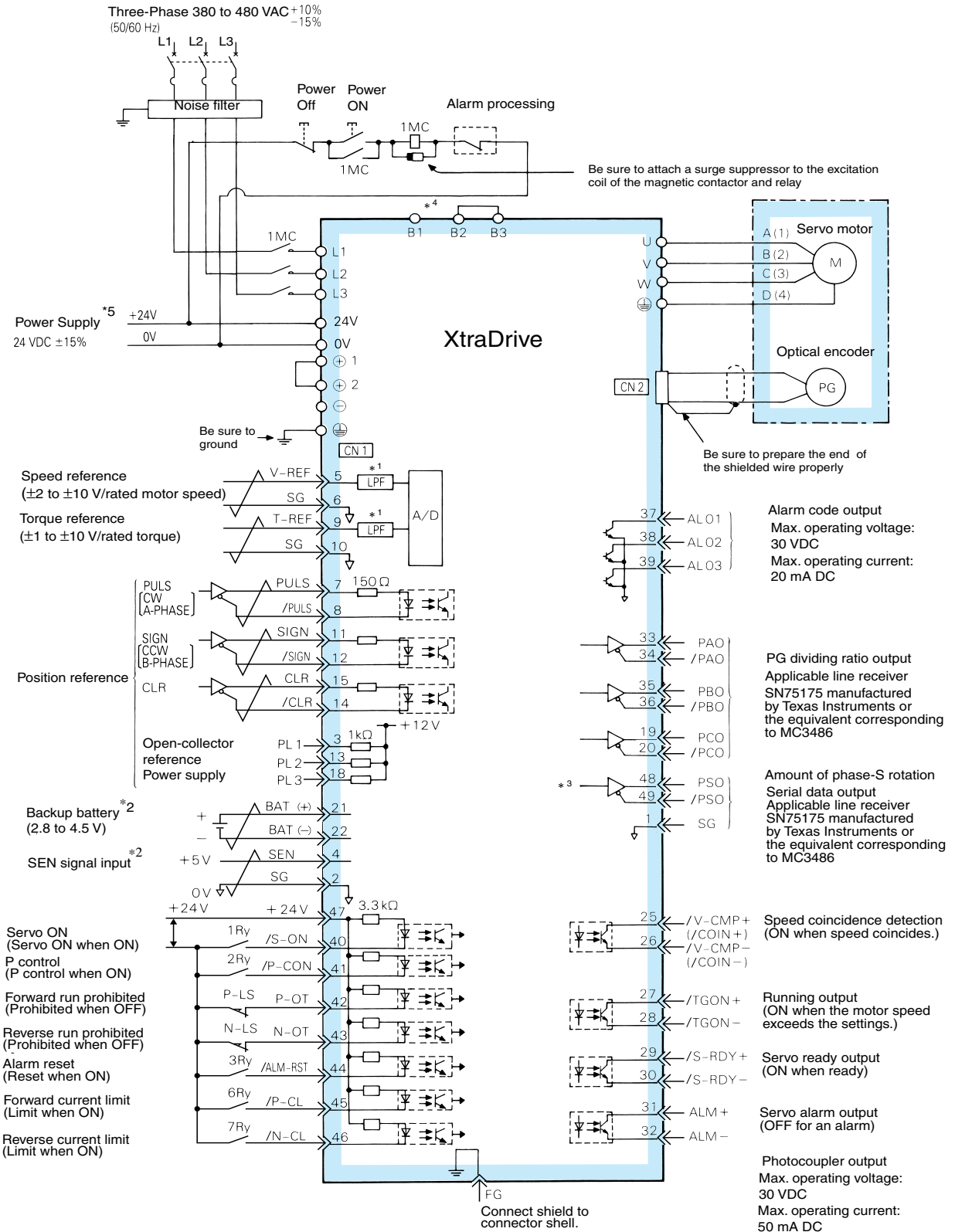
*2 Connect when using an absolute encoder.

*3 Used only with an absolute encoder.

*4 Regenerative resistor can be connected between B1 and B2.

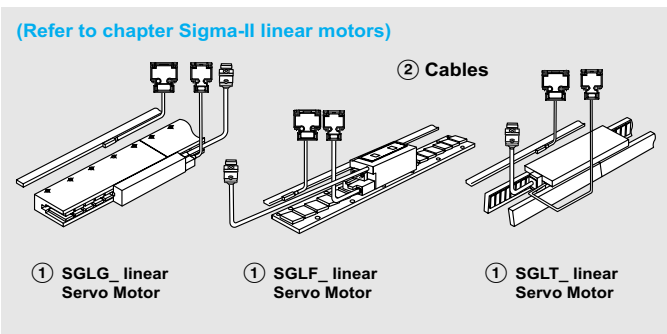
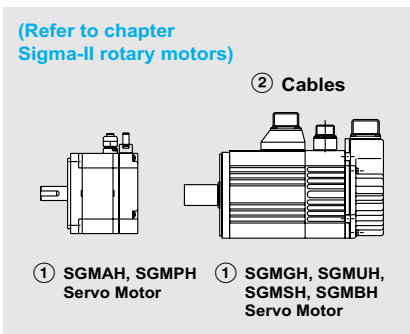
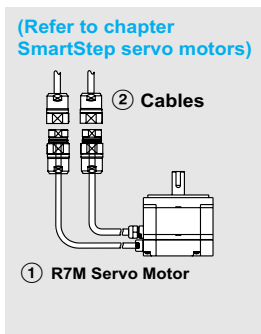
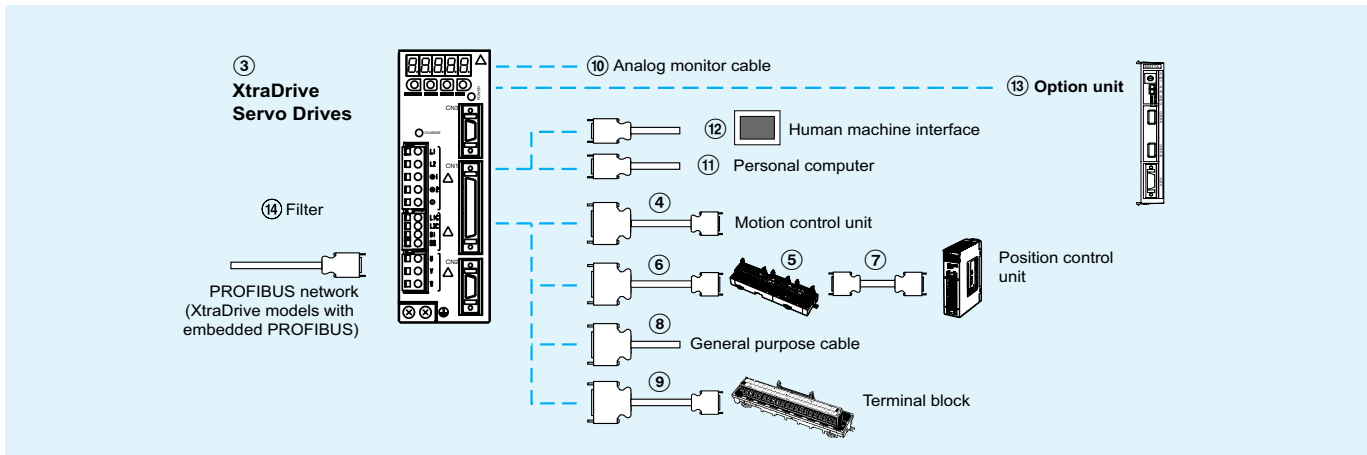
*6 TI stands for Texas Instruments Inc.

Three-phase, 400 VAC



*1 The time constant for the primary filter is 47 μ s.
 *2 Connect when using an absolute encoder.
 *3 Used only with an absolute encoder.
 *4 For using an external regenerative resistor, connect it between B1 and B2.
 *5 The 24VDC power is supplied by the user.
 *6 TI stands for Texas Instruments Inc.

Ordering information



Note: The symbols ①②③④⑤... show the recommended sequence to select the components for a servo system

Servo motors, power & encoder cables

Note: ①② Refer to the servo motors chapter for detailed motor specifications and selection

Servo Drives

Symol	Specifications	XtraDrive	XtraDrive-E with electronic CAM	XtraDrive-DP with PROFIBUS	XtraDrive-DP-E with PROFIBUS and electronic CAM	Compatible servo motors ①			
						Sigma-II rotary	SmartStep	Sigma linear motors	
③	1 phase 200 VAC	30 W	XD-P3-MN01	XD-P3-MN01-E	XD-P3-MSD0	XD-P3-MSD0-E	SGMAH-A3A□	R7M-A03030-□	-
		50 W	XD-P5-MN01	XD-P5-MN01-E	XD-P5-MSD0	XD-P5-MSD0-E	SGMAH-A5D□	R7M-A05030-□	SGLGW-30A050□
		100 W	XD-01-MN01	XD-01-MN01-E	XD-01-MSD0	XD-01-MSD0-E	SGMAH-01A□, SGMPH-01A□	R7M-A10030-□, R7M-AP10030-□	SGLGW-30A080□, SGLGW-40A140□
		200 W	XD-02-MN01	XD-02-MN01-E	XD-02-MSD0	XD-02-MSD0-E	SGMAH-02A□, SGMPH-02A□	R7M-A20030-□, R7M-AP20030-□	SGLFW-20A□, SGLFW-35A120□, SGLGW-40A253A□, SGLGW-60A140□
		400 W	XD-04-MN01	XD-04-MN01-E	XD-04-MSD0	XD-04-MSD0-E	SGMAH-04A□, SGMPH-04A□	R7M-A40030-□, R7M-AP40030-□	SGLGW-40A365A□, SGLGW-60A253A□
		750 W	XD-08-MN	XD-08-MN00-E	XD-08-MSD0	XD-08-MSD0-E	SGMAH-08A□, SGMPH-08A□	R7M-A75030-□, R7M-AP75030-□	SGLFW-35A230□, SGLFW-50A200□, SGLGW-60A365A□
		1.5 kW	XD-15-MN	XD-15-MN00-E	-	-	SGMPH-15A□	-	SGLFW-50A380□, SGLFW-1ZA200□, SGLGW-90A200A□
	3 Phase 400 VAC	0.5 kW	XD-05-TN	XD-05-TN00-E	XD-05-TSD0	XD-05-TSD0-E	SGMGH-05D□, SGMAH-03D□, SGMPH-02D□/04D□	-	SGLFW-35D□
		1.0 kW	XD-10-TN	XD-10-TN00-E	XD-10-TSD0	XD-10-TSD0-E	SGMGH-09D□, SGMSH/UH-10D□, SGMAH-07D□, SGMPH-08D□	-	SGLFW-50D200□, SGLTW-35D170□, SGLTW-50D170□
		1.5 kW	XD-15-TN	XD-15-TN00-E	XD-15-TSD0	XD-15-TSD0-E	SGMGH-13D□, SGMSH/UH-15D□, SGMPH-15D□	-	SGLFW-50D380□, SGLFW-1ZD200□
		2.0 kW	XD-20-TN	XD-20-TN00-E	XD-20-TSD0	XD-20-TSD0-E	SGMGH-20D□, SGMSH-20D□	-	SGLFW-1ED380□, SGLTW-35D320□, SGLTW-50D320□
		3.0 kW	XD-30-TN	XD-30-TN00-E	XD-30-TSD0	XD-30-TSD0-E	SGMGH-30D□, SGMSH/UH-30D□	-	SGLFW-1ZD380□, SGLFW-1ED560□, SGLTW-40D400□
		5.0 kW	XD-50-TN	XD-50-TN00-E	-	-	SGMGH-44D□, SGMSH/UH-40D□, SGMSH-50D□	-	SGLTW-40D600□, SGLTW-80D400□

Note: SGLGW-□ linear motor combination is made considering the use of standard magnets. Refer to the linear motors chapter for details

Control cables (for CN1)

Symbol	Description	Connect to	Len	Model		
④	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		
	Servo drive connecting cable (1 axis)	Motion control unit C200HW-MC402-E	1 m	R88A-CMUK001J3-E2		
PLC unit control cables (4 axes)	1 m		R88A-CMX001S-E			
	1 m		R88A-CMX001J1-E			
⑤	Servo relay unit	CS1W-NC1□3, CJ1W-NC1□3, or C200HW-NC113 Position control unit	1 m	XW2B-20J6-1B (1 axis)		
			2 m	XW2B-40J6-2B (2 axes)		
		CS1W-NC2□3/4□3, CJ1W-NC2□3/4□3, or C200HW-NC213/ 413 Position control unit	1 m	XW2B-20J6-3B (1 axis)		
			2 m	XW2B-40J6-8A (1 axis) XW2B-40J6-9A (2 axes)		
		CQM1H-PLB21 CQM1-CPU43	1 m	XW2B-20J6-3B (1 axis)		
			2 m	XW2B-40J6-8A (1 axis) XW2B-40J6-9A (2 axes)		
		CJ1M-CPU22/23	1 m	XW2B-20J6-8A (1 axis)		
			2 m	XW2B-40J6-9A (2 axes)		
		⑥	Cable to servo drive	Servo relay units XW2B-□0J6-□B	1 m	XW2Z-100J-B4
					2 m	XW2Z-200J-B4
⑦	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				
⑧	Control cable	For general purpose controllers	1 m	R88A-CPW001S or JZSP-CKI01-1		
			2 m	R88A-CPW002S or JZSP-CKI01-2		
⑨	Relay terminal block cable	General purpose controller	1 m	R88A-CTW001N		
			2 m	R88A-CTW002N		
	Relay terminal block	-	XW2B-50G5			

Cable (for CN5)

Symbol	Name	Model
⑩	Analog monitor cable	R88A-CMW001S or DE9404559

Options (for CN3)

Symbol	Name	Model
⑪	Computer connecting cable	R88A-CCW002P2 or JZSP-CMS02

Human machine interface

Symbol	Name	Model
⑫	4.1" HMI monochrome	NT3S-ST126B-E

Option units (for CN10)

Symbol	Name	Model
⑬	IO card, 8 inputs / 8 outputs	XDIO-08

Filters

Symbol	Applicable servo drive	Filter model	Rated current	Rated voltage
⑭	XD-P3-M□, XD-P5-M□, XD-01-M□, XD-02-M□	R88A-FIW104-SE	4 A	250 VAC single- phase
		R88A-FIW107-SE	7A	
		R88A-FIW115-SE	15 A	
	XD-04-M□ XD-08-M□ XD-15-M□	R88A-FIW125-SE	25 A	400 VAC three- phase
		R88A-FIW4006-SE	6 A	
		R88A-FIW4010-SE	10 A	
XD-05-T□, XD-10-T□, XD-15-T□ XD-20-T□, XD-30-T□ XD-50-T□	R88A-FIW4020-SE	20 A		

Battery backup for absolute encoder

Name	Model
Battery (required for servo motors with absolute encoder)	JZSP-BA01 ER6VC3 (3.6V)

Connectors

Specification	Model
Control I/O connector (for CN1)	R88A-CNU11C or JZSP-CKI9
XtraDrive 200 V connector kit (for 200 V motors SGMAH/PH-□□A□□□D-OY and R7M-A□-D)	Connectors included DE9406973 SPOC-17H-FRON169 SPOC-06K-FSDN169
XtraDrive 400 V connector kit. (for 400 V motors SGMAH/PH-□□D□□□D-OY)	Connectors included DE9406973 SPOC-17H-FRON169 LPRA-06B-FRBN170
Sigma-II drive encoder connector (For CN2)	DE9406973 or R88A-CNU01R
Hypertac encoder connector IP67 (for motors SGMAH/PH-□□□□□□□D-OY and R7M-A□-D)	SPOC-17H-FRON169
Hypertac power connector IP67, 200 V. (for 200 V motors SGMAH/PH-□□A□□□D-OY and R7M-A□-D)	SPOC-06K-FSDN169
Hypertac power connector IP67, 400 V. (for 400 V Motors SGMAH/PH-□□D□□□D-OY)	LPRA-06B-FRBN170
Military encoder connector IP67 (for Motors SGMGH-□, SGMUH-□)	MS3108E20-29S
Military power connector IP67 (for 400 V motors SGMGH-(05/10/13)D□, SGMSH-(10/15/20)D□, SGMUH-(10/15)D□)	MS3108E18-10S
Military power connector IP67 (for 400 V motors SGMGH-(20/30/44)D□, SGMSH-(30/40/50)D□, SGMUH-(30/40)D□)	MS3108E22-22S
Military brake connector IP67 (for 400 V servo motors SGMGH-□, SGMSH-□, SGMUH-□)	MS3108E10SL-3S

Computer software

Specifications	Model
XtraWare	MOTION TOOLS

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.