Document No.	: SX-DSV03002
Revision No.	: 4.4
Date of Issue	: Oct. 1, 2022
Classification	: ☐ New ■ Change

SPECIFICATIONS

Product Name : AC servo driver

Product Series Name : MINAS-A5BD1, A5B21 series

Product Model Number :

Motion Control Business Unit, Industrial Device Business Division
Panasonic Industry Co., Ltd.
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If you have any questions, please contact the seller (Sales office or Distributor) of the product.

Panasonic

REVISIONS

Date	Page	Rev.	Description	Signed
May. 28, 2015	-	1.0	NEWLY ISSUED	-
Jul. 1,2015	1	2.0	Change software version 3.01 → 3.02	-
Nov.12, 2015	1	3.0	Change Software version 3.02→3.04	-
	4~9		Add Model of motor equipped with 20bit Absolute encoder	
Apr. 19, 2016	-	4.0	Change Company name Smart Factory Solutions → Mechatronics	-
	P61,64		Correct Part number of noise filter	
Jun. 1, 2018	P12,13	4.1	Change the heatsink (size A,B)	-
Apr. 1, 2022	-	4.2	Changed the company name	-
	-		Changed the front cover format	
Jun. 15, 2022	P63	4.3	Corrected typographical errors	-
Oct. 1, 2022	P58	4.4	Changed Compliance with EU Directive/UL Standard	-

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Specification for Each Model

1. Scope

The specifications are for AC servo driver MINAS-A5B Series standard models and MINAS-A5B21 Series made by Motion Control Business Unit, Panasonic Industry Co., Ltd.

This product is intended for industrial equipment. It cannot be used for any other purposes (e.g. for household)

<Software version>

This technical reference applies to the servo drivers compatible with software of the following version:

Version 1:Ver3.04
Version 2:Ver3.04
Version 3:Ver1.00

For the software version, confirm it by the setup support software PANATERM or other function.

<Related documents>

SX-DSV02472: Technical document - Basic Function specification-
SX-DSV02473: Technical document - EtherCAT communication specification -

＜Summary of EtherCAT＞

EtherCAT is an abbreviated designation of Ethernet for Control Automation Technology and is open network communication between a master and slaves using real-time ethernet developed in Beckhoff Automation GmbH and is managed in ETG (EtherCAT Technology Group).

EtherCAT® is registered trademark and patented technology,
licensed by Beckhoff Automation GmbH, Germany.

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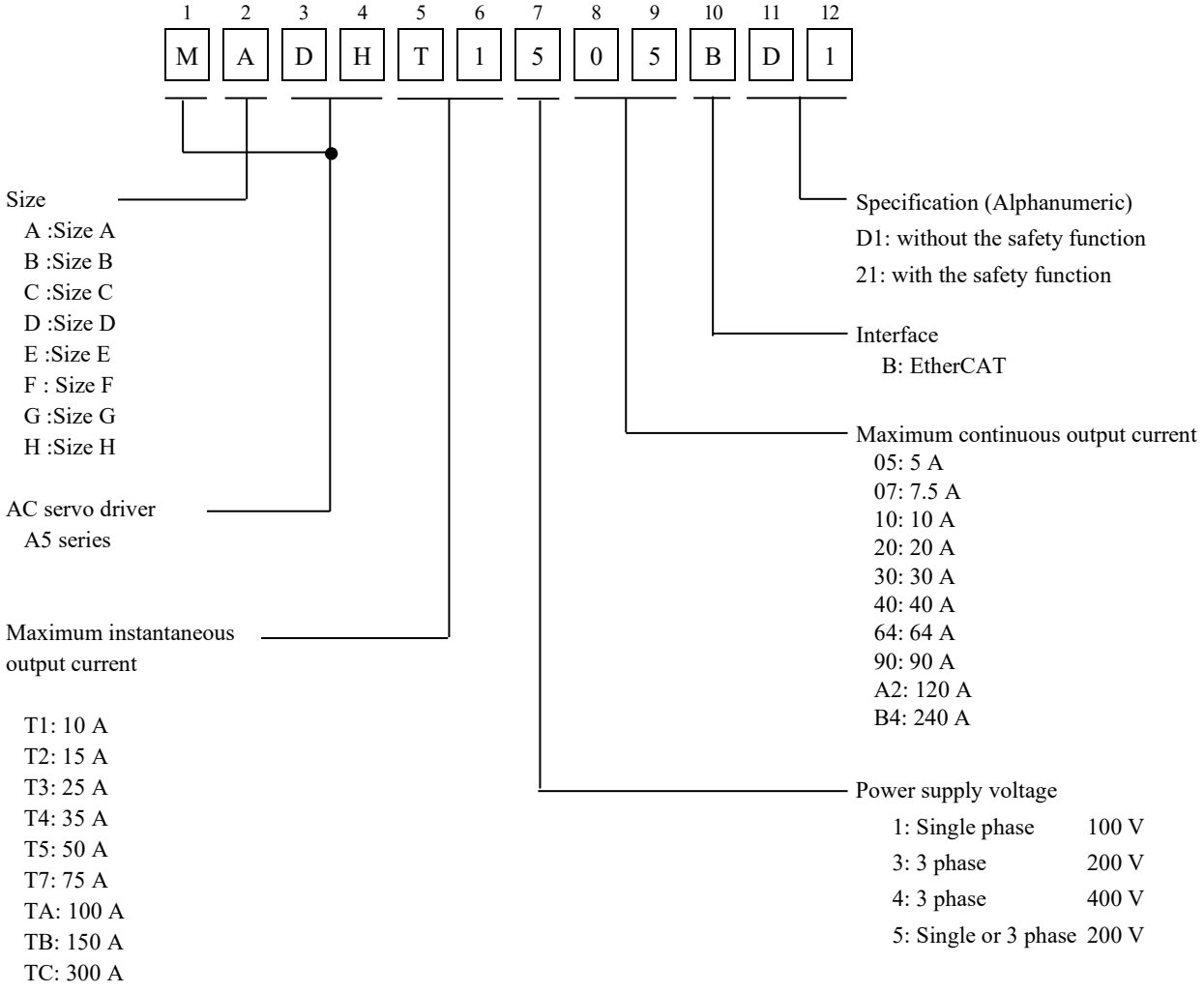
- Motion Control Business Unit, Panasonic Industry Co., Ltd. reserves the right to make modifications and improvements to its products and/or documentation, including specifications and software, without prior notice.
- This product might be forced to upgrade according to the specifications change by ETG. We do not have liability for expenses of such upgrades.

2. Product number

The following shows how to interpret a product number.



3. Product Line-up

Model No. (Note 1)		Size	Power supply voltage	Rated output of applicable motor
MINAS-A5BD1 Series (Without the safety function)	MINAS-A5B21 Series (With the safety function)			
MADHT1105BD1	MADHT1105B21	A	Single-phase AC100–120 V	Max 50 W
MADHT1107BD1	MADHT1107B21			Max 100 W
MADHT1505BD1	MADHT1505B21		Single/3-phase AC 200–240 V	Max 100 W
MADHT1507BD1	MADHT1507B21			Max 200 W
MBDHT2110BD1	MBDHT2110B21	B	Single-phase AC100–120 V	Max 200 W
MBDHT2510BD1	MBDHT2510B21		Single/3-phase AC 200–240 V	Max 400 W
MCDHT3120BD1	MCDHT3120B21	C	Single-phase AC100–120 V	Max 400 W
MCDHT3520BD1	MCDHT3520B21		Single/3-phase AC 200–240 V	Max 750 W
MDDHT3530BD1	MDDHT3530B21	D	Single/3-phase AC 200–240 V	Max 1,000 W
MDDHT5540BD1	MDDHT5540B21			Max 1,500 W
MDDHT2407BD1	MDDHT2407B21		3-phase AC 380–480 V	Max 600 W
MDDHT2412BD1	MDDHT2412B21			Max 1,000 W
MDDHT3420BD1	MDDHT3420B21			Max 1,500 W
MEDHT7364BD1	MEDHT7364B21	E	3-phase AC 200–230 V	Max 2,500 W
MEDHT4430BD1	MEDHT4430B21		3-phase AC 380–480 V	Max 2,500 W
MFDHTA390BD1	MFDHTA390B21	F	3-phase AC 200–230 V	Max 3,000 W
MFDHTB3A2BD1	MFDHTB3A2B21			Max 5,000 W
MFDHT5440BD1	MFDHT5440B21		3-phase AC 380–480 V	Max 3,000 W
MFDHTA464BD1	MFDHTA464B21			Max 5,000 W
-	MGDHTC3B4B21	G	3-phase AC 200–230 V	Max 7,500 W
-	MGDHTB4A2B21		3-phase AC 380–480 V	Max 7,500 W
-	MHDHTC3B4B21	H	3-phase AC 200–230 V	Max 15,000 W
-	MHDHTB4A2B21		3-phase AC 380–480 V	Max 15,000 W

(Note 1) MINAS-A5B21 Series are the models which are added the safety function to MINAS-A5BD1 series.

Combination of Servo Driver and Applicable Motor

Servo Driver			Applicable Motor				
Model	Size	Power supply input	Model	Voltage specification	Rated Output	Rated speed	Encoder specification
MADHT1105B**	A	Single 100 V	MSME5AZG**	100 V	50 W	3000 r/min	5 cores, 20 bits
			MSME5AZS**	100 V	50 W	3000 r/min	7 cores, 17 bits
			MSME5AZF**	100 V	50 W	3000 r/min	7 cores, 20 bits
MADHT1107B**	A	Single 100 V	MSME011G**	100 V	100 W	3000 r/min	5 cores, 20 bits
			MSME011S**	100 V	100 W	3000 r/min	7 cores, 17 bits
			MSME011F**	100 V	100 W	3000 r/min	7 cores, 20 bits
MADHT1505B**	A	Single/ 3 phase 200 V	MSME5AZG**	200 V	50 W	3000 r/min	5 cores, 20 bits
			MSME5AZS**	200 V	50 W	3000 r/min	7 cores, 17 bits
			MSME5AZF**	200 V	50 W	3000 r/min	7 cores, 20 bits
			MSME012G**	200 V	100 W	3000 r/min	5 cores, 20 bits
			MSME012S**	200 V	100 W	3000 r/min	7 cores, 17 bits
			MSME012F**	200 V	100 W	3000 r/min	7 cores, 20 bits
MADHT1507B**	A	Single/3 phase 200 V	MSME022G**	200 V	200 W	3000 r/min	5 cores, 20 bits
			MSME022S**	200 V	200 W	3000 r/min	7 cores, 17 bits
			MSME022F**	200 V	200 W	3000 r/min	7 cores, 20 bits
MBDHT2110B**	B	Single 100 V	MSME021G**	100 V	200 W	3000 r/min	5 cores, 20 bits
			MSME021S**	100 V	200 W	3000 r/min	7 cores, 17 bits
			MSME021F**	100 V	200 W	3000 r/min	7 cores, 20 bits
MBDHT2510B**	B	Single/3 phase 200 V	MSME042G**	200 V	400 W	3000 r/min	5 cores, 20 bits
			MSME042S**	200 V	400 W	3000 r/min	7 cores, 17 bits
			MSME042F**	200 V	400 W	3000 r/min	7 cores, 20 bits
MCDHT3120B**	C	Single 100 V	MSME041G**	100 V	400 W	3000 r/min	5 cores, 20 bits
			MSME041S**	100 V	400 W	3000 r/min	7 cores, 17 bits
			MSME041F**	100 V	400 W	3000 r/min	7 cores, 20 bits
MCDHT3520B**	C	Single/3 phase 200 V	MSME082G**	200 V	750 W	3000 r/min	5 cores, 20 bits
			MSME082S**	200 V	750 W	3000 r/min	7 cores, 17 bits
			MSME082F**	200 V	750 W	3000 r/min	7 cores, 20 bits

Servo Driver			Applicable Motor				
Model	Size	Power supply input	Model	Voltage specification	Rated Output	Rated speed	Encoder specification
MDDHT3530B**	D	Single/3 phase 200 V	MDME102G**	200 V	1.0 kW	2000 r/min	5 cores, 20 bits
			MDME102S**	200 V	1.0 kW	2000 r/min	7 cores, 17 bits
			MDME102F**	200 V	1.0 kW	2000 r/min	7 cores, 20 bits
			MHME102G**	200 V	1.0 kW	2000 r/min	5 cores, 20 bits
			MHME102S**	200 V	1.0 kW	2000 r/min	7 cores, 17 bits
			MHME102F**	200 V	1.0 kW	2000 r/min	7 cores, 20 bits
MDDHT5540B**	D	Single/3 phase 200 V	MGME092G**	200 V	900 W	1000 r/min	5 cores, 20 bits
			MGME092S**	200 V	900 W	1000 r/min	7 cores, 17 bits
			MGME092F**	200 V	900 W	1000 r/min	7 cores, 20 bits
			MSME102G**	200 V	1.0 kW	3000 r/min	5 cores, 20 bits
			MSME102S**	200 V	1.0 kW	3000 r/min	7 cores, 17 bits
			MSME102F**	200 V	1.0 kW	3000 r/min	7 cores, 20 bits
			MDME152G**	200 V	1.5 kW	2000 r/min	5 cores, 20 bits
			MDME152S**	200 V	1.5 kW	2000 r/min	7 cores, 17 bits
			MDME152F**	200 V	1.5 kW	2000 r/min	7 cores, 20 bits
			MSME152G**	200 V	1.5 kW	3000 r/min	5 cores, 20 bits
			MSME152S**	200 V	1.5 kW	3000 r/min	7 cores, 17 bits
			MSME152F**	200 V	1.5 kW	3000 r/min	7 cores, 20 bits
			MHME152G**	200 V	1.5 kW	2000 r/min	5 cores, 20 bits
			MHME152S**	200 V	1.5 kW	2000 r/min	7 cores, 17 bits
			MHME152F**	200 V	1.5 kW	2000 r/min	7 cores, 20 bits
			MFME152G**	200 V	1.5 kW	2000 r/min	5 cores, 20 bits
			MFME152S**	200 V	1.5 kW	2000 r/min	7 cores, 17 bits
			MFME152F**	200 V	1.5 kW	2000 r/min	7 cores, 20 bits
MEDHT7364B**	E	3 phase 200 V	MDME202G**	200 V	2.0 kW	2000 r/min	5 cores, 20 bits
			MDME202S**	200 V	2.0 kW	2000 r/min	7 cores, 17 bits
			MDME202F**	200 V	2.0 kW	2000 r/min	7 cores, 20 bits
			MSME202G**	200 V	2.0 kW	3000 r/min	5 cores, 20 bits
			MSME202S**	200 V	2.0 kW	3000 r/min	7 cores, 17 bits
			MSME202F**	200 V	2.0 kW	3000 r/min	7 cores, 20 bits
			MHME202G**	200 V	2.0 kW	2000 r/min	5 cores, 20 bits
			MHME202S**	200 V	2.0 kW	2000 r/min	7 cores, 17 bits
			MHME202F**	200 V	2.0 kW	2000 r/min	7 cores, 20 bits
			MFME252G**	200 V	2.5 kW	2000 r/min	5 cores, 20 bits
			MFME252S**	200 V	2.5 kW	2000 r/min	7 cores, 17 bits
			MFME252F**	200 V	2.5 kW	2000 r/min	7 cores, 20 bits

Servo Driver			Applicable Motor				
Model	Size	Power supply input	Model	Voltage specification	Rated Output	Rated speed	Encoder specification
MFDHTA390B**	F	3 phase 200 V	MGME202G**	200 V	2.0 kW	1000r/min	5 cores, 20 bits
			MGME202S**	200 V	2.0 kW	1000r/min	7 cores, 17 bits
			MGME202F**	200 V	2.0 kW	1000r/min	7 cores, 20 bits
			MDME302G**	200 V	3.0 kW	2000r/min	5 cores, 20 bits
			MDME302S**	200 V	3.0 kW	2000r/min	7 cores, 17 bits
			MDME302F**	200 V	3.0 kW	2000r/min	7 cores, 20 bits
			MHME302G**	200 V	3.0 kW	2000r/min	5 cores, 20 bits
			MHME302S**	200 V	3.0 kW	2000r/min	7 cores, 17 bits
			MHME302F**	200 V	3.0 kW	2000r/min	7 cores, 20 bits
			MSME302G**	200 V	3.0 kW	3000r/min	5 cores, 20 bits
			MSME302S**	200 V	3.0 kW	3000r/min	7 cores, 17 bits
			MSME302F**	200 V	3.0 kW	3000r/min	7 cores, 20 bits
MFDHTB3A2B**	F	3 phase 200 V	MGME302G**	200 V	3.0 kW	1000r/min	5 cores, 20 bits
			MGME302S**	200 V	3.0 kW	1000r/min	7 cores, 17 bits
			MGME302F**	200 V	3.0 kW	1000r/min	7 cores, 20 bits
			MDME402G**	200 V	4.0 kW	2000r/min	5 cores, 20 bits
			MDME402S**	200 V	4.0 kW	2000r/min	7 cores, 17 bits
			MDME402F**	200 V	4.0 kW	2000r/min	7 cores, 20 bits
			MHME402G**	200 V	4.0 kW	2000r/min	5 cores, 20 bits
			MHME402S**	200 V	4.0 kW	2000r/min	7 cores, 17 bits
			MHME402F**	200 V	4.0 kW	2000r/min	7 cores, 20 bits
			MSME402G**	200 V	4.0 kW	3000r/min	5 cores, 20 bits
			MSME402S**	200 V	4.0 kW	3000r/min	7 cores, 17 bits
			MSME402F**	200 V	4.0 kW	3000r/min	7 cores, 20 bits
			MGME452G**	200 V	4.5 kW	1000r/min	5 cores, 20 bits
			MGME452S**	200 V	4.5 kW	1000r/min	7 cores, 17 bits
			MGME452F**	200 V	4.5 kW	1000r/min	7 cores, 20 bits
			MFME452G**	200 V	4.5 kW	2000r/min	5 cores, 20 bits
			MFME452S**	200 V	4.5 kW	2000r/min	7 cores, 17 bits
			MFME452F**	200 V	4.5 kW	2000r/min	7 cores, 20 bits
			MDME502G**	200 V	5.0 kW	2000r/min	5 cores, 20 bits
			MDME502S**	200 V	5.0 kW	2000r/min	7 cores, 17 bits
			MDME502F**	200 V	5.0 kW	2000r/min	7 cores, 20 bits
			MHME502G**	200 V	5.0 kW	2000r/min	5 cores, 20 bits
			MHME502S**	200 V	5.0 kW	2000r/min	7 cores, 17 bits
			MHME502F**	200 V	5.0 kW	2000r/min	7 cores, 20 bits
			MSME502G**	200 V	5.0 kW	3000r/min	5 cores, 20 bits
			MSME502S**	200 V	5.0 kW	3000r/min	7 cores, 17 bits
			MSME502F**	200 V	5.0 kW	3000r/min	7 cores, 20 bits

Servo Driver			Applicable Motor				
Model	Size	Power supply input	Model	Voltage specification	Rated Output	Rated speed	Encoder specification
MGDHTC3B4B**	G	3 phase 200 V	MGME602G**	200 V	6.0 kW	1000 r/min	5 cores, 20 bits
			MGME602S**	200 V	6.0 kW	1000 r/min	7 cores, 17 bits
			MGME602F**	200 V	6.0 kW	1000 r/min	7 cores, 20 bits
			MDME752G**	200 V	7.5 kW	1500 r/min	5 cores, 20 bits
			MDME752S**	200 V	7.5 kW	1500 r/min	7 cores, 17 bits
			MDME752F**	200 V	7.5 kW	1500 r/min	7 cores, 20 bits
			MHME752G**	200 V	7.5 kW	1500 r/min	5 cores, 20 bits
			MHME752S**	200 V	7.5 kW	1500 r/min	7 cores, 17 bits
			MHME752F**	200 V	7.5 kW	1500 r/min	7 cores, 20 bits
MHDHTC3B4B**	H	3 phase 200 V	MDMEC12G**	200 V	11.0 kW	1500 r/min	5 cores, 20 bits
			MDMEC12S**	200 V	11.0 kW	1500 r/min	7 cores, 17 bits
			MDMEC12F**	200 V	11.0 kW	1500 r/min	7 cores, 20 bits
			MHMEC52G**	200 V	15.0 kW	1500 r/min	5 cores, 20 bits
			MHMEC52S**	200 V	15.0 kW	1500 r/min	7 cores, 17 bits
			MHMEC52F**	200 V	15.0 kW	1500 r/min	7 cores, 20 bits

Servo Driver			Applicable Motor				
Model	Size	Power supply input	Model	Voltage specification	Rated Output	Rated speed	Encoder specification
MDDHT2407B**	D	3 phase 400 V	MDME044G**	400 V	400 W	2000 r/min	5 cores, 20 bits
			MDME044S**	400 V	400 W	2000 r/min	7 cores, 17 bits
			MDME044F**	400 V	400 W	2000 r/min	7 cores, 20 bits
			MDME064G**	400 V	600 W	2000 r/min	5 cores, 20 bits
			MDME064S**	400 V	600 W	2000 r/min	7 cores, 17 bits
			MDME064F**	400 V	600 W	2000 r/min	7 cores, 20 bits
MDDHT2412B**	D	3 phase 400 V	MSME084G**	400 V	750 W	3000 r/min	5 cores, 20 bits
			MSME084S**	400 V	750 W	3000 r/min	7 cores, 17 bits
			MSME084F**	400 V	750 W	3000 r/min	7 cores, 20 bits
			MDME104G**	400 V	1.0 kW	2000 r/min	5 cores, 20 bits
			MDME104S**	400 V	1.0 kW	2000 r/min	7 cores, 17 bits
			MDME104F**	400 V	1.0 kW	2000 r/min	7 cores, 20 bits
			MHME104G**	400 V	1.0 kW	2000 r/min	5 cores, 20 bits
			MHME104S**	400 V	1.0 kW	2000 r/min	7 cores, 17 bits
			MHME104F**	400 V	1.0 kW	2000 r/min	7 cores, 20 bits
MDDHT3420B**	D	3 phase 400 V	MGME094G**	400 V	900 W	1000 r/min	5 cores, 20 bits
			MGME094S**	400 V	900 W	1000 r/min	7 cores, 17 bits
			MGME094F**	400 V	900 W	1000 r/min	7 cores, 20 bits
			MSME104G**	400 V	1.0 kW	3000 r/min	5 cores, 20 bits
			MSME104S**	400 V	1.0 kW	3000 r/min	7 cores, 17 bits
			MSME104F**	400 V	1.0 kW	3000 r/min	7 cores, 20 bits
			MDME154G**	400 V	1.5 kW	2000 r/min	5 cores, 20 bits
			MDME154S**	400 V	1.5 kW	2000 r/min	7 cores, 17 bits
			MDME154F**	400 V	1.5 kW	2000 r/min	7 cores, 20 bits
			MHME154G**	400 V	1.5 kW	2000 r/min	5 cores, 20 bits
			MHME154S**	400 V	1.5 kW	2000 r/min	7 cores, 17 bits
			MHME154F**	400 V	1.5 kW	2000 r/min	7 cores, 20 bits
			MSME154G**	400 V	1.5 kW	3000 r/min	5 cores, 20 bits
			MSME154S**	400 V	1.5 kW	3000 r/min	7 cores, 17 bits
			MSME154F**	400 V	1.5 kW	3000 r/min	7 cores, 20 bits
			MFME154G**	400 V	1.5 kW	2000 r/min	5 cores, 20 bits
			MFME154S**	400 V	1.5 kW	2000 r/min	7 cores, 17 bits
			MFME154F**	400 V	1.5 kW	2000 r/min	7 cores, 20 bits

Servo Driver			Applicable Motor				
Model	Size	Power supply input	Model	Voltage specification	Rated Output	Rated speed	Encoder specification
MEDHT4430B**	E	3 phase 400V	MSME204G**	400 V	2.0 kW	3000 r/min	5 cores, 20 bits
			MSME204S**	400 V	2.0 kW	3000 r/min	7 cores, 17 bits
			MSME204F**	400 V	2.0 kW	3000 r/min	7 cores, 20 bits
			MDME204G**	400 V	2.0 kW	2000 r/min	5 cores, 20 bits
			MDME204S**	400 V	2.0 kW	2000 r/min	7 cores, 17 bits
			MDME204F**	400 V	2.0 kW	2000 r/min	7 cores, 20 bits
			MHME204G**	400 V	2.0 kW	2000 r/min	5 cores, 20 bits
			MHME204S**	400 V	2.0 kW	2000 r/min	7 cores, 17 bits
			MHME204F**	400 V	2.0 kW	2000 r/min	7 cores, 20 bits
			MFME254G**	400 V	2.5 kW	2000 r/min	5 cores, 20 bits
			MFME254S**	400 V	2.5 kW	2000 r/min	7 cores, 17 bits
			MFME254F**	400 V	2.5 kW	2000 r/min	7 cores, 20 bits
MFDHT5440B**	F	3 phase 400 V	MGME204G**	400 V	2.0 kW	1000 r/min	5 cores, 20 bits
			MGME204S**	400 V	2.0 kW	1000 r/min	7 cores, 17 bits
			MGME204F**	400 V	2.0 kW	1000 r/min	7 cores, 20 bits
			MSME304G**	400 V	3.0 kW	3000 r/min	5 cores, 20 bits
			MSME304S**	400 V	3.0 kW	3000 r/min	7 cores, 17 bits
			MSME304F**	400 V	3.0 kW	3000 r/min	7 cores, 20 bits
			MDME304G**	400 V	3.0 kW	2000 r/min	5 cores, 20 bits
			MDME304S**	400 V	3.0 kW	2000 r/min	7 cores, 17 bits
			MDME304F**	400 V	3.0 kW	2000 r/min	7 cores, 20 bits
			MHME304G**	400 V	3.0 kW	2000 r/min	5 cores, 20 bits
			MHME304S**	400 V	3.0 kW	2000 r/min	7 cores, 17 bits
			MHME304F**	400 V	3.0 kW	2000 r/min	7 cores, 20 bits

Servo Driver			Applicable Motor				
Model	Size	Power supply input	Model	Voltage specification	Rated Output	Rated speed	Encoder specification
MFDHTA464B**	F	3 phase 400 V	MGME304G**	400 V	3.0 kW	1000 r/min	5 cores, 20 bits
			MGME304S**	400 V	3.0 kW	1000 r/min	7 cores, 17 bits
			MGME304F**	400 V	3.0 kW	1000 r/min	7 cores, 20 bits
			MSME404G**	400 V	4.0 kW	3000 r/min	5 cores, 20 bits
			MSME404S**	400 V	4.0 kW	3000 r/min	7 cores, 17 bits
			MSME404F**	400 V	4.0 kW	3000 r/min	7 cores, 20 bits
			MDME404G**	400 V	4.0 kW	2000 r/min	5 cores, 20 bits
			MDME404S**	400 V	4.0 kW	2000 r/min	7 cores, 17 bits
			MDME404F**	400 V	4.0 kW	2000 r/min	7 cores, 20 bits
			MHME404G**	400 V	4.0 kW	2000 r/min	5 cores, 20 bits
			MHME404S**	400 V	4.0 kW	2000 r/min	7 cores, 17 bits
			MHME404F**	400 V	4.0 kW	2000 r/min	7 cores, 20 bits
			MGME454G**	400 V	4.5 kW	1000 r/min	5 cores, 20 bits
			MGME454S**	400 V	4.5 kW	1000 r/min	7 cores, 17 bits
			MGME454F**	400 V	4.5 kW	1000 r/min	7 cores, 20 bits
			MFME454G**	400 V	4.5 kW	2000 r/min	5 cores, 20 bits
			MFME454S**	400 V	4.5 kW	2000 r/min	7 cores, 17 bits
			MFME454F**	400 V	4.5 kW	2000 r/min	7 cores, 20 bits
			MSME504G**	400 V	5.0 kW	3000 r/min	5 cores, 20 bits
			MSME504S**	400 V	5.0 kW	3000 r/min	7 cores, 17 bits
			MSME504F**	400 V	5.0 kW	3000 r/min	7 cores, 20 bits
			MDME504G**	400 V	5.0 kW	2000 r/min	5 cores, 20 bits
			MDME504S**	400 V	5.0 kW	2000 r/min	7 cores, 17 bits
			MSME504F**	400 V	5.0 kW	3000 r/min	7 cores, 20 bits
			MHME504G**	400 V	5.0 kW	2000 r/min	5 cores, 20 bits
			MHME504S**	400 V	5.0 kW	2000 r/min	7 cores, 17 bits
			MHME504F**	400 V	5.0 kW	2000 r/min	7 cores, 20 bits
MGDHTB4A2B**	G	3 phase 400 V	MGME604G**	400 V	6.0 kW	1000 r/min	5 cores, 20 bits
			MGME604S**	400 V	6.0 kW	1000 r/min	7 cores, 17 bits
			MGME604F**	400 V	6.0 kW	1000 r/min	7 cores, 20 bits
			MDME754G**	400 V	7.5 kW	1500 r/min	5 cores, 20 bits
			MDME754S**	400 V	7.5 kW	1500 r/min	7 cores, 17 bits
			MDME754F**	400 V	7.5 kW	1500 r/min	7 cores, 20 bits
			MHME754G**	400 V	7.5 kW	1500 r/min	5 cores, 20 bits
			MHME754S**	400 V	7.5 kW	1500 r/min	7 cores, 17 bits
			MHME754F**	400 V	7.5 kW	1500 r/min	7 cores, 20 bits
MHDHTB4A2B**	H	3 phase 400 V	MDMEC14G**	400 V	11.0 kW	1500 r/min	5 cores, 20 bits
			MDMEC14S**	400 V	11.0 kW	1500 r/min	7 cores, 17 bits
			MDMEC14F**	400 V	11.0 kW	1500 r/min	7 cores, 20 bits
			MHMEC54G**	400 V	15.0 kW	1500 r/min	5 cores, 20 bits
			MHMEC54S**	400 V	15.0 kW	1500 r/min	7 cores, 17 bits
			MHMEC54F**	400 V	15.0 kW	1500 r/min	7 cores, 20 bits

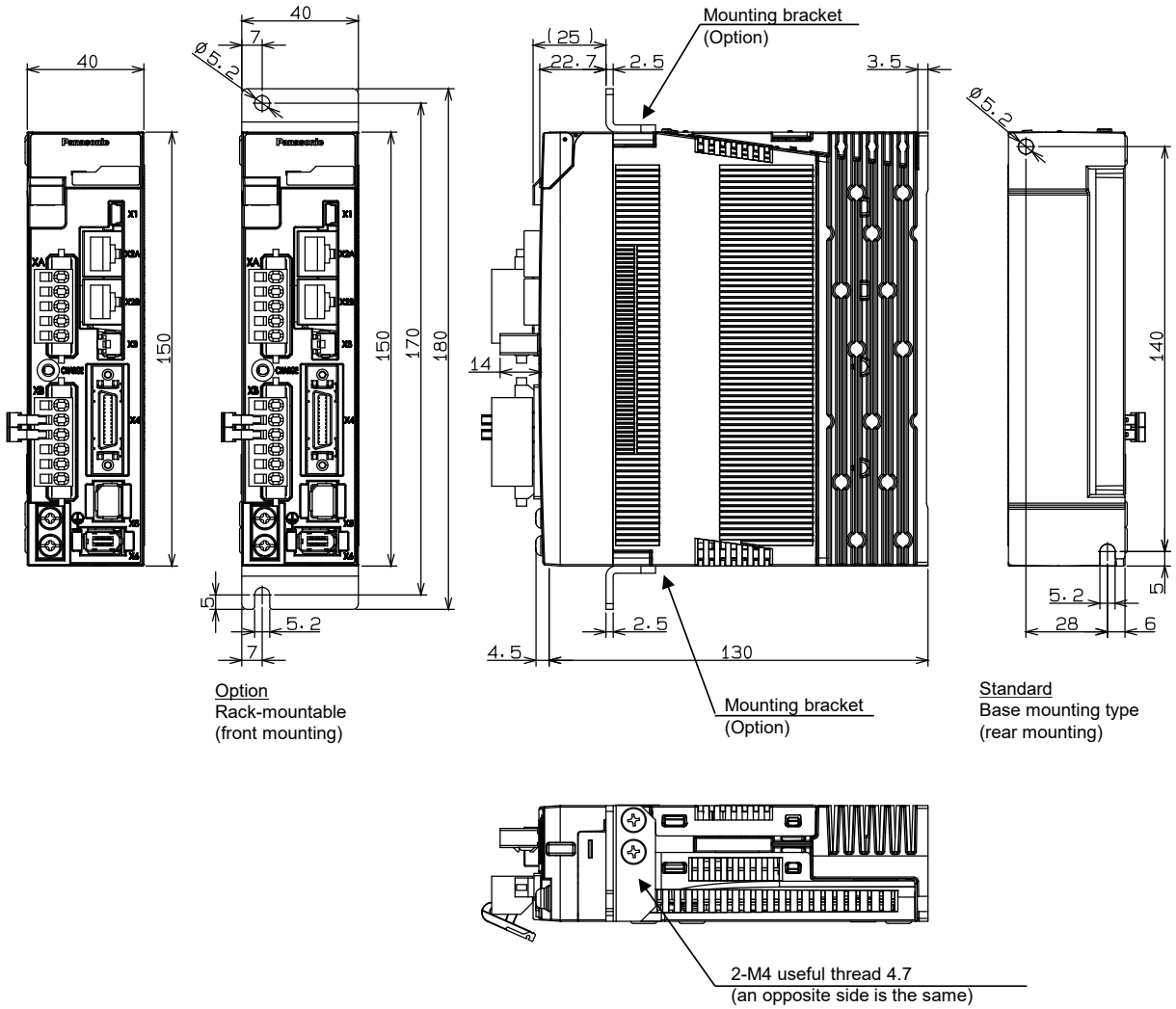
4. Specifications

<table>
<tr><th colspan="4">Item</th><th>Description</th></tr>
<tr><td rowspan="8">Input power supply</td><td rowspan="2">100 V</td><td colspan="2">Main circuit power</td><td>Single phase 100–120 V ac +10% -15% 50/60 Hz</td></tr>
<tr><td colspan="2">Control circuit power</td><td>Single phase 100–120 V ac +10% -15% 50/60 Hz</td></tr>
<tr><td rowspan="4">200 V</td><td rowspan="2">Main circuit power</td><td>A–D</td><td>Single/3 phase 200–240 V ac +10% -15% 50/60 Hz</td></tr>
<tr><td>E–H</td><td>3 phase 200–230 V ac +10% -15% 50/60 Hz</td></tr>
<tr><td rowspan="2">Control circuit power</td><td>A–D</td><td>Single phase 200–240 V ac +10% -15% 50/60 Hz</td></tr>
<tr><td>E–H</td><td>Single phase 200–230 V ac +10% -15% 50/60 Hz</td></tr>
<tr><td rowspan="2">400 V</td><td>Main circuit power</td><td rowspan="2">D-H</td><td>3 phase 380–480 V ac +10% -15% 50/60 Hz</td></tr>
<tr><td>Control circuit power</td><td>24 V dc +/- 15%</td></tr>
<tr><td colspan="4">Insulation voltage</td><td>Resistant to 1,500 V AC between primary power supply and ground for a minute
* Excluding control circuit power supply part (24 V dc) of 400 V models.</td></tr>
<tr><td rowspan="4">Operation conditions</td><td colspan="3">Temperature</td><td>Operation temperature: 0–55 degrees C Storage temperature: -20–65 degrees C</td></tr>
<tr><td colspan="3">Humidity</td><td>Operation and storage humidity 90%RH or less (no condensation)</td></tr>
<tr><td colspan="3">Height above the sea</td><td>Height above the sea level: 1,000 meters or less</td></tr>
<tr><td colspan="3">Vibration</td><td>5. 88 m/s^2 or less, 10–60 Hz (Continuous operation at resonance point is not allowed)</td></tr>
</table>

5. Dimensions

● MINAS-A5BD1 and A5B21 Series

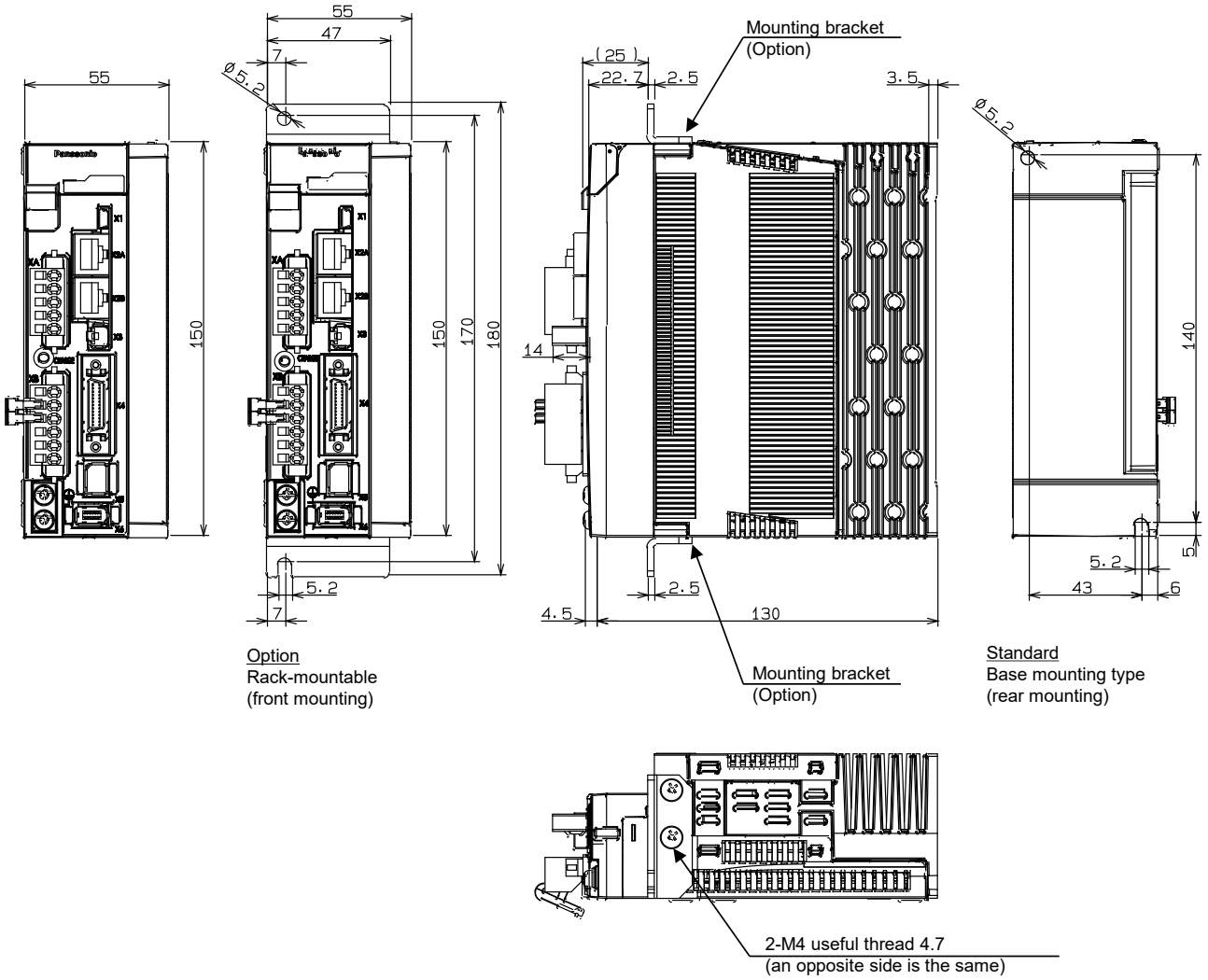
Size A 100 V/200 V



[Front mounting bracket Optional part number]

	Part number
For size A	DV0PM20027

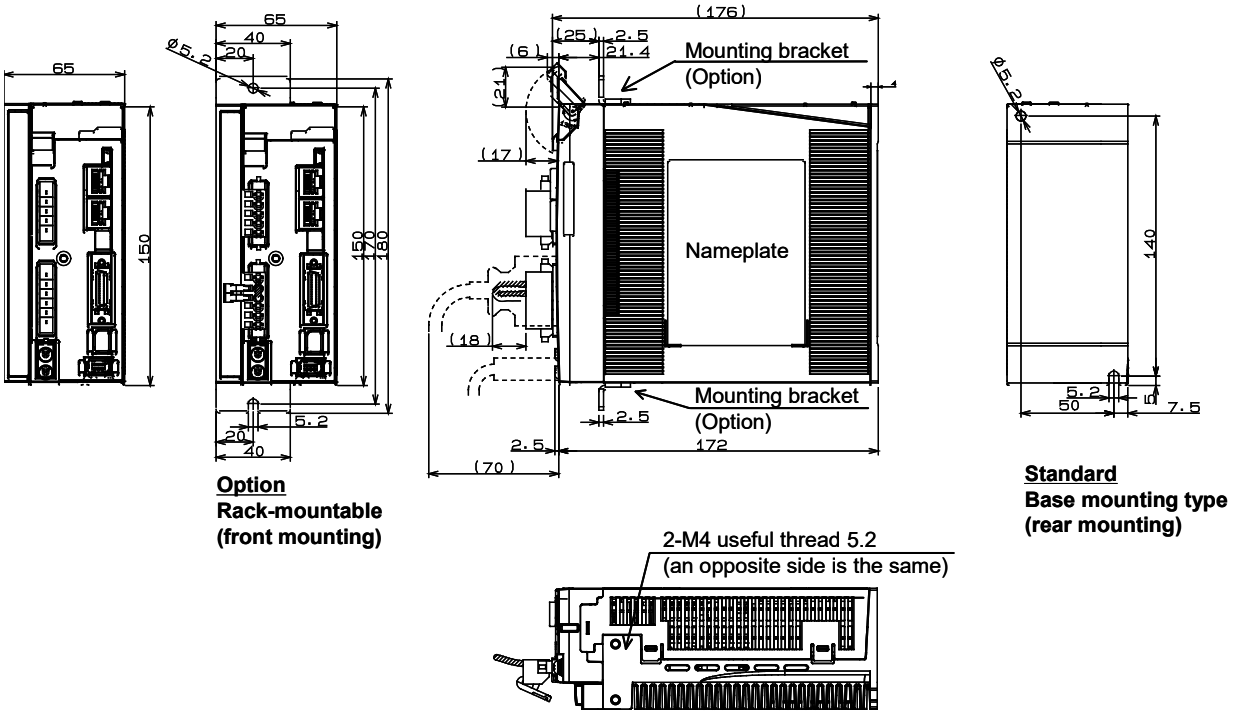
Size B 100 V/200 V



[Front mounting bracket Optional part number]

	Part number
For size B	DV0PM20028

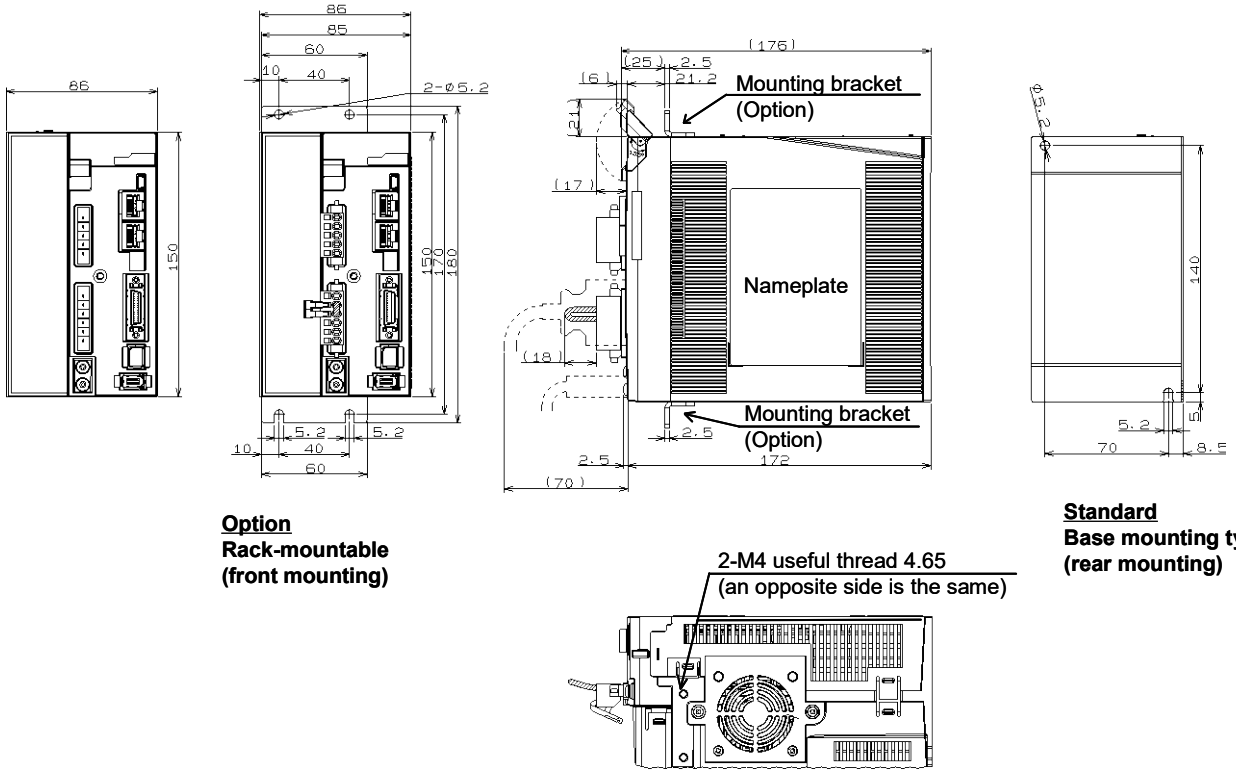
Size C 100 V/200 V



[Front mounting bracket Optional part number]

	Part number
For size C	DV0PM20029

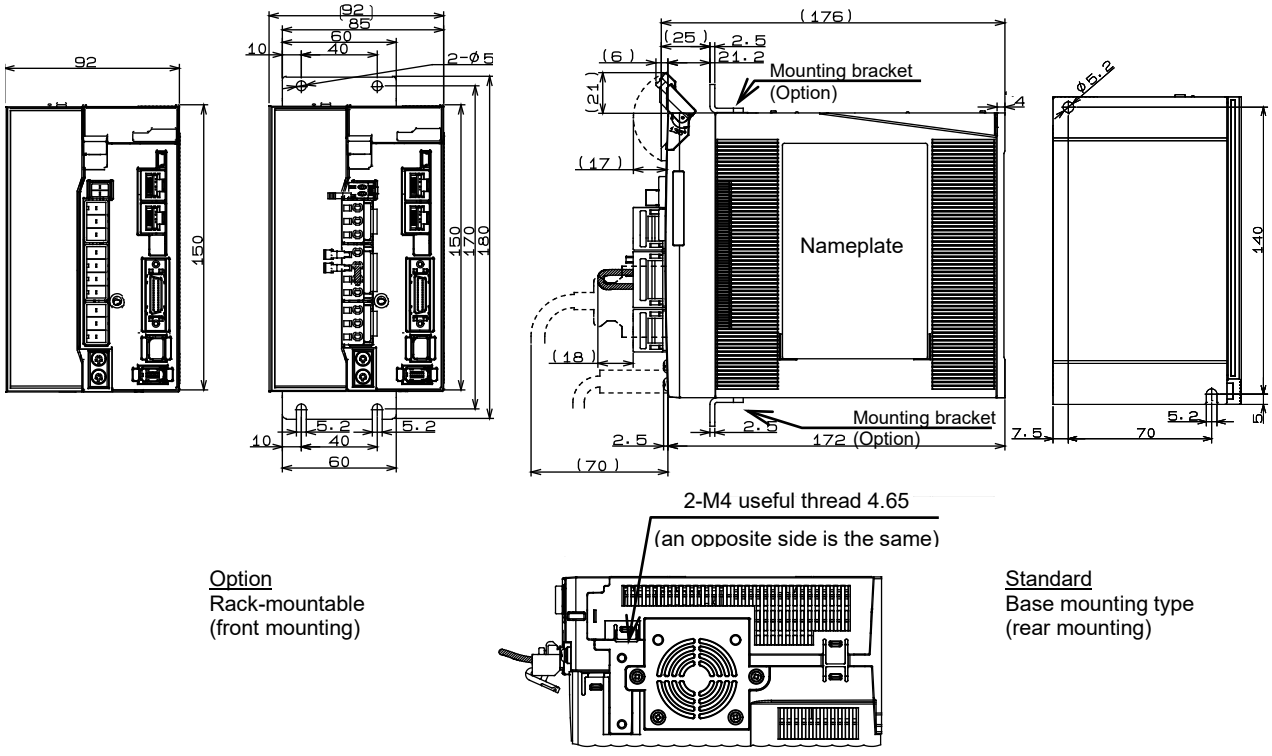
Size D 200 V



Option
Rack-mountable
(front mounting)

Standard
Base mounting type
(rear mounting)

Size D 400 V



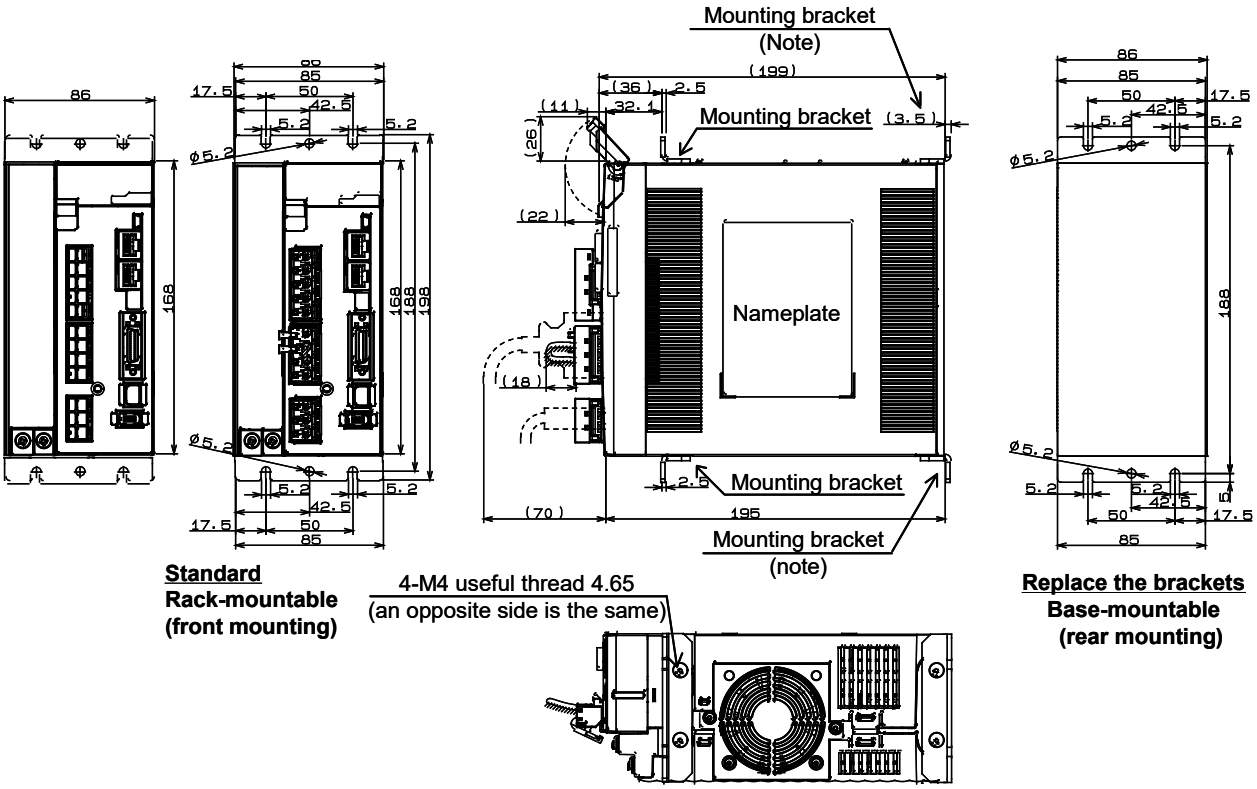
Option
Rack-mountable
(front mounting)

Standard
Base mounting type
(rear mounting)

[Front mounting bracket Optional part number]

	Part number
For size D	DV0PM20030

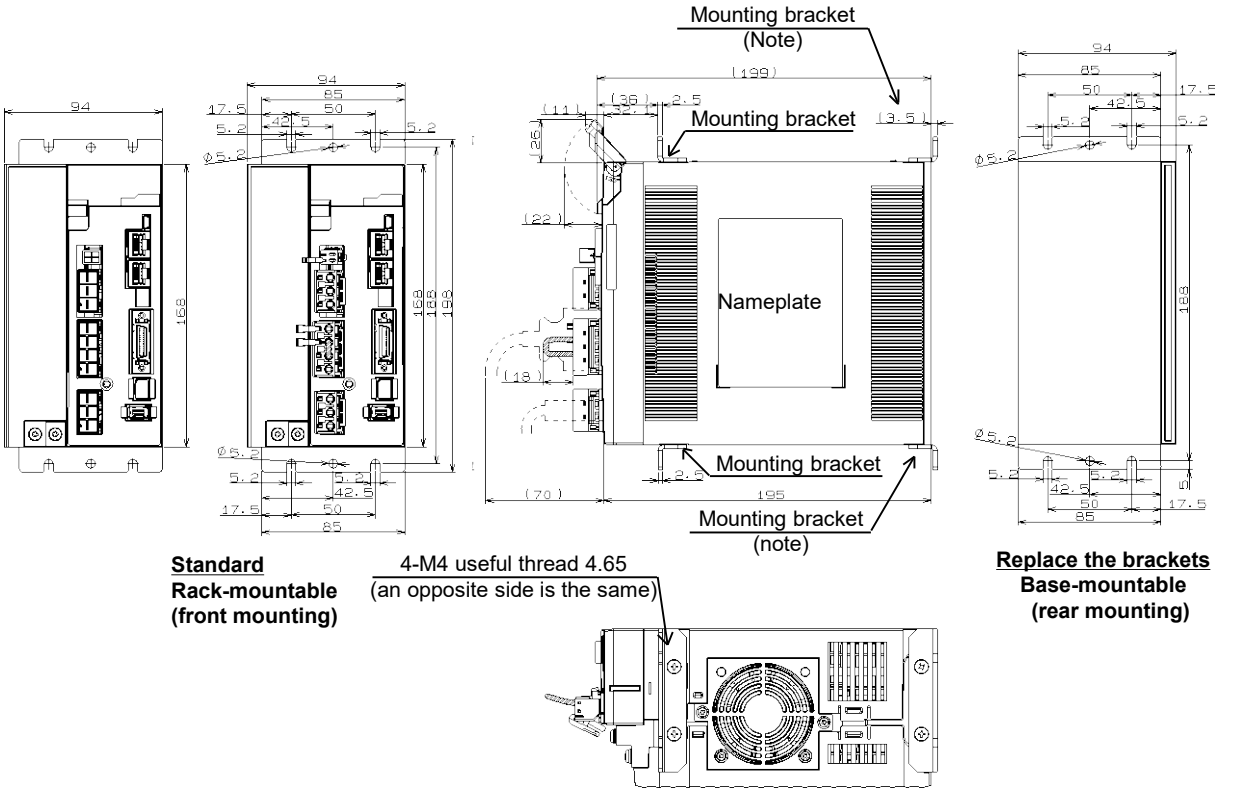
Size E 200 V



Standard
Rack-mountable
(front mounting)

Replace the brackets
Base-mountable
(rear mounting)

Size E 400 V

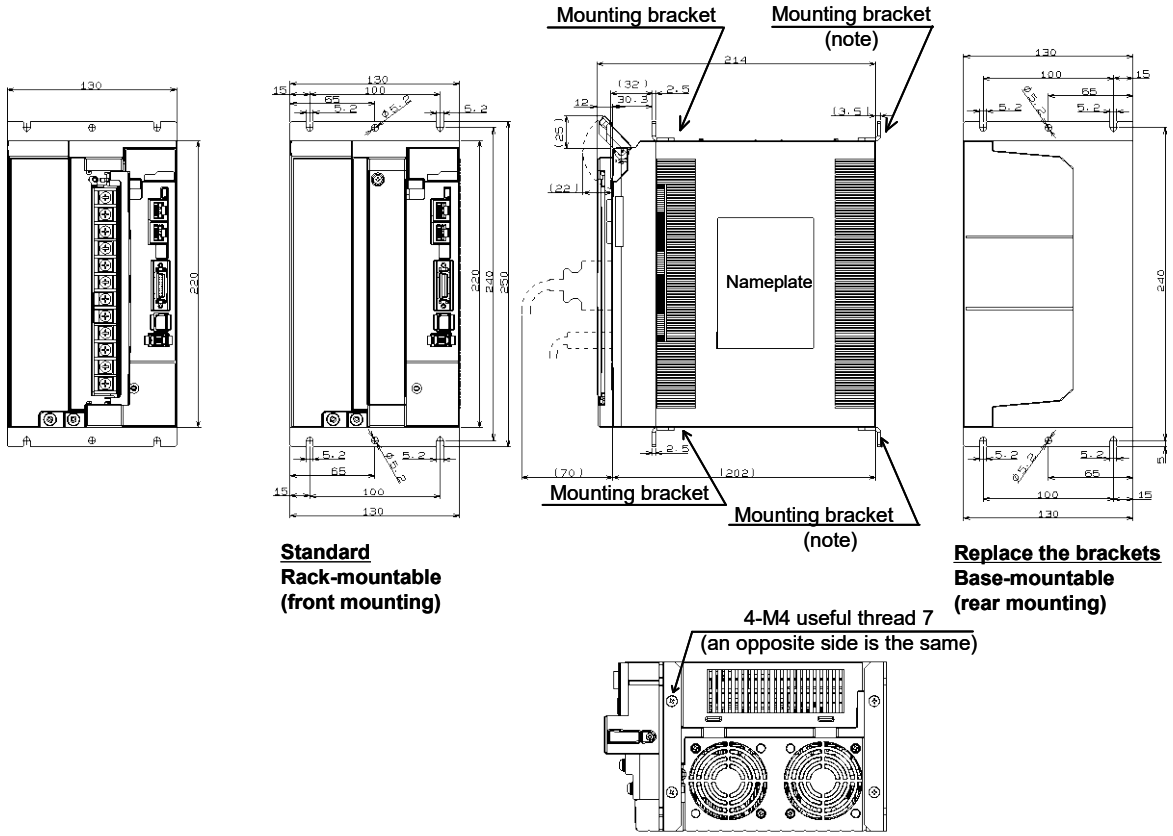


Standard
Rack-mountable
(front mounting)

Replace the brackets
Base-mountable
(rear mounting)

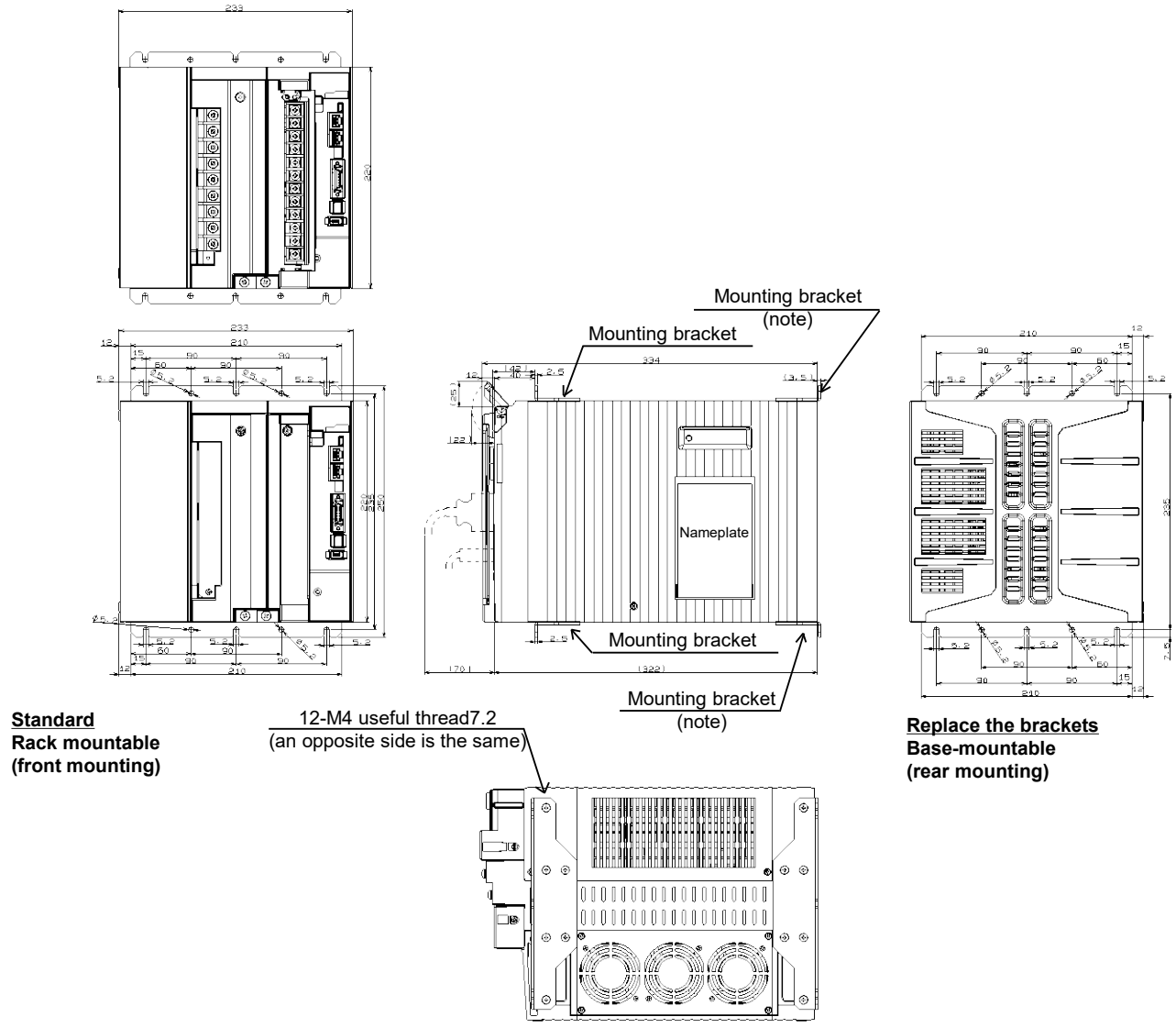
Note: For base mounting type (rear mounting type), attach the mounting bracket to the rear surface. Although the above figure shows brackets attached to both the front and rear surfaces, the unit is shipped out with the bracket attached to only the front.

Size F 200 V/400 V



Note: For base mounting type (rear mounting type), attach the mounting bracket to the rear surface. Although the above figure shows brackets attached to both the front and rear surfaces, the unit is shipped out with the bracket attached to only the front.

Size G 200 V/400 V

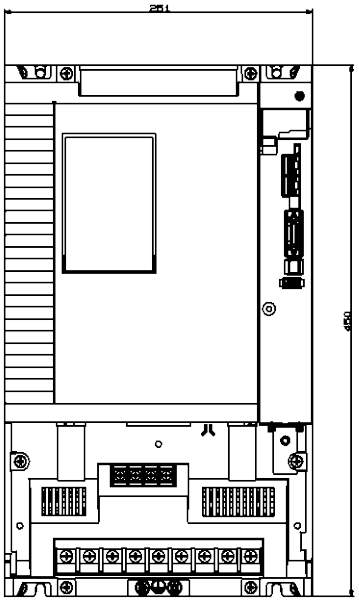


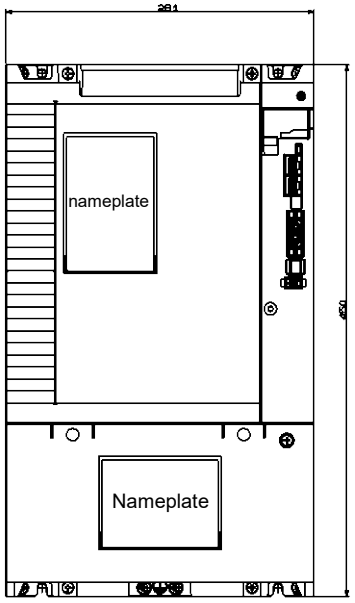
Standard
Rack mountable
(front mounting)

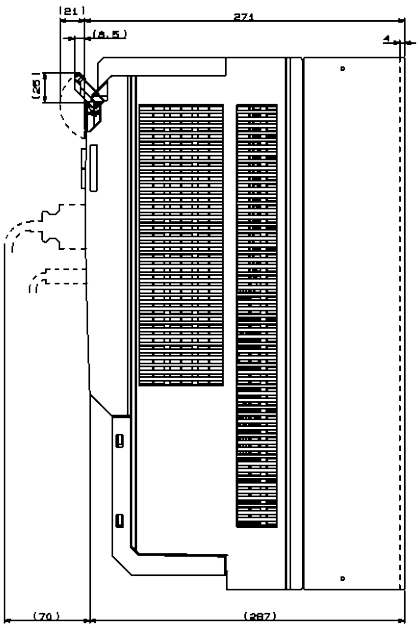
Replace the brackets
Base-mountable
(rear mounting)

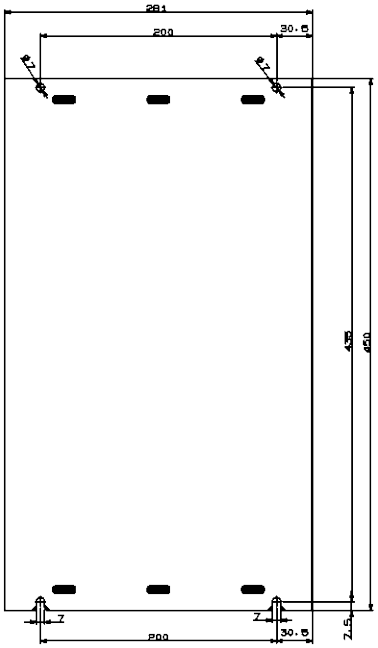
Note: For base mounting type (rear mounting type), attach the mounting bracket to the rear surface. Although the above figure shows brackets attached to both the front and rear surfaces, the unit is shipped out with the bracket attached to only the front.

Size H 200 V/400 V

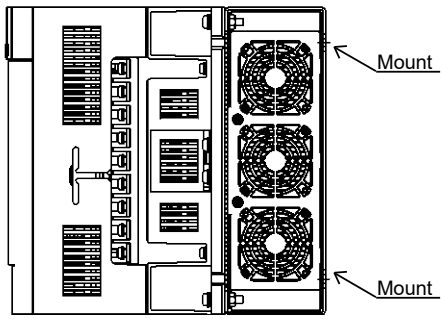








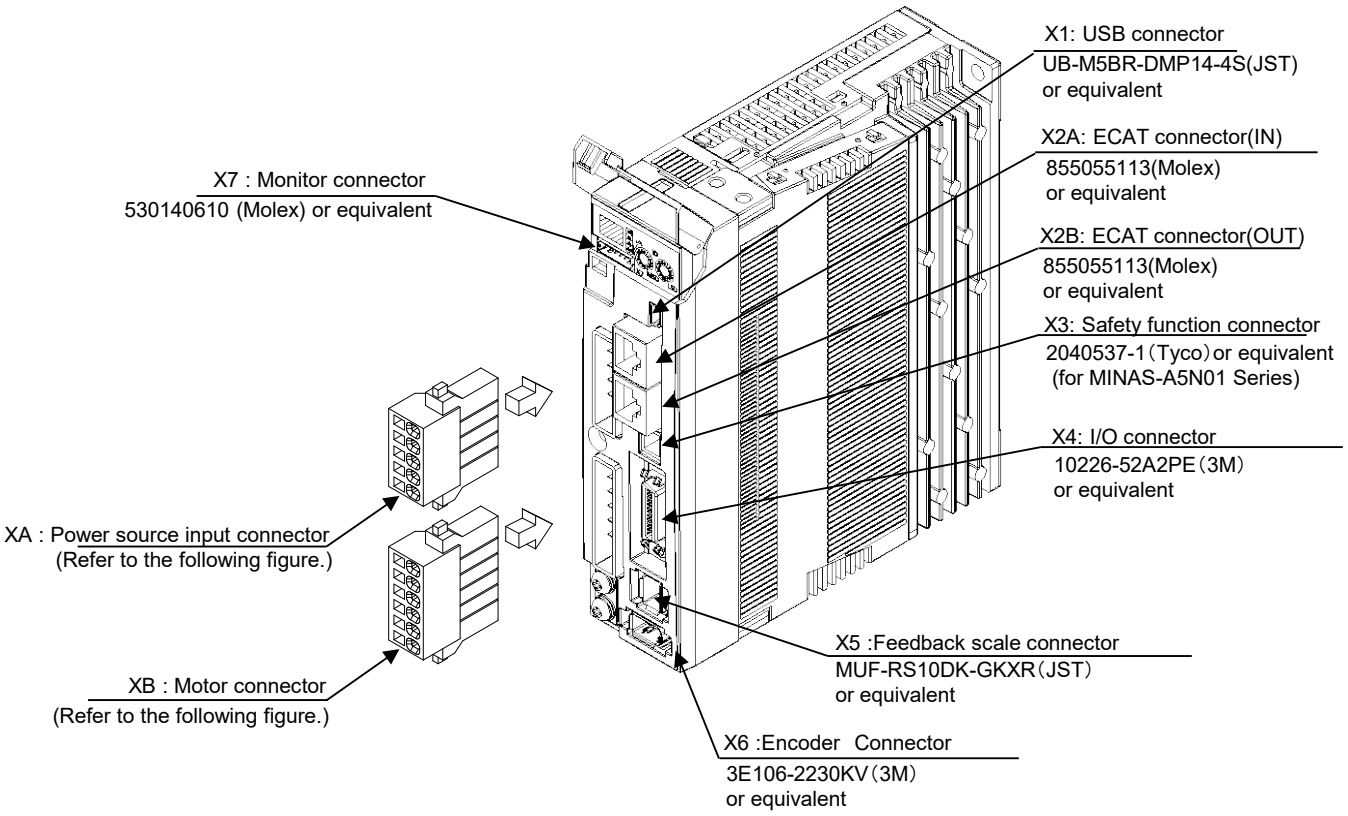
Base mounting type (rear mounting)



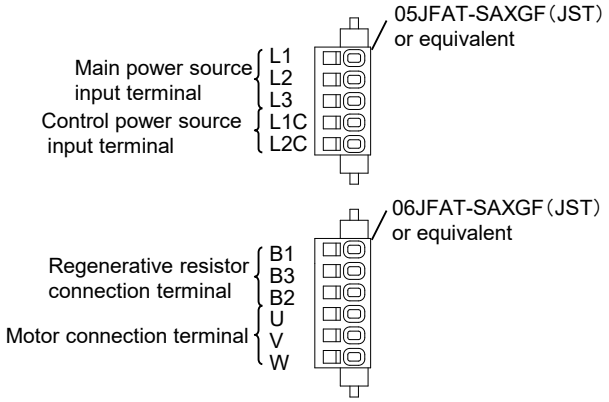
Note: For base mounting type (rear mounting type), attach the mounting bracket to the rear surface. Although the above figure shows brackets attached to both the front and rear surfaces, the unit is shipped out with the bracket attached to only the front.

6. Appearance and Part Names

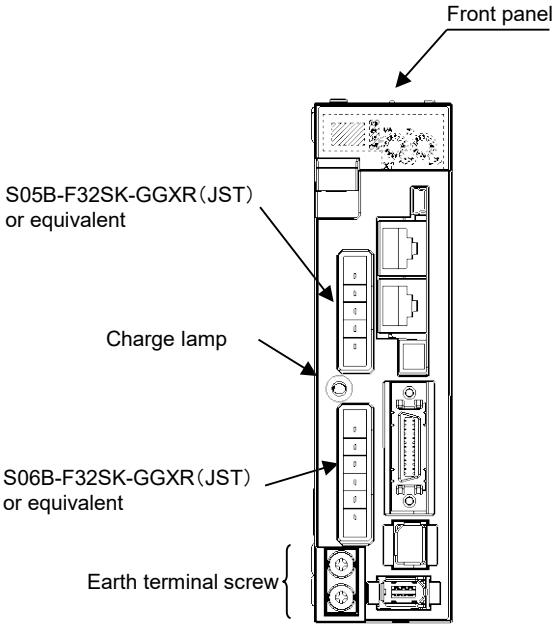
Size A, B 100 V/200 V



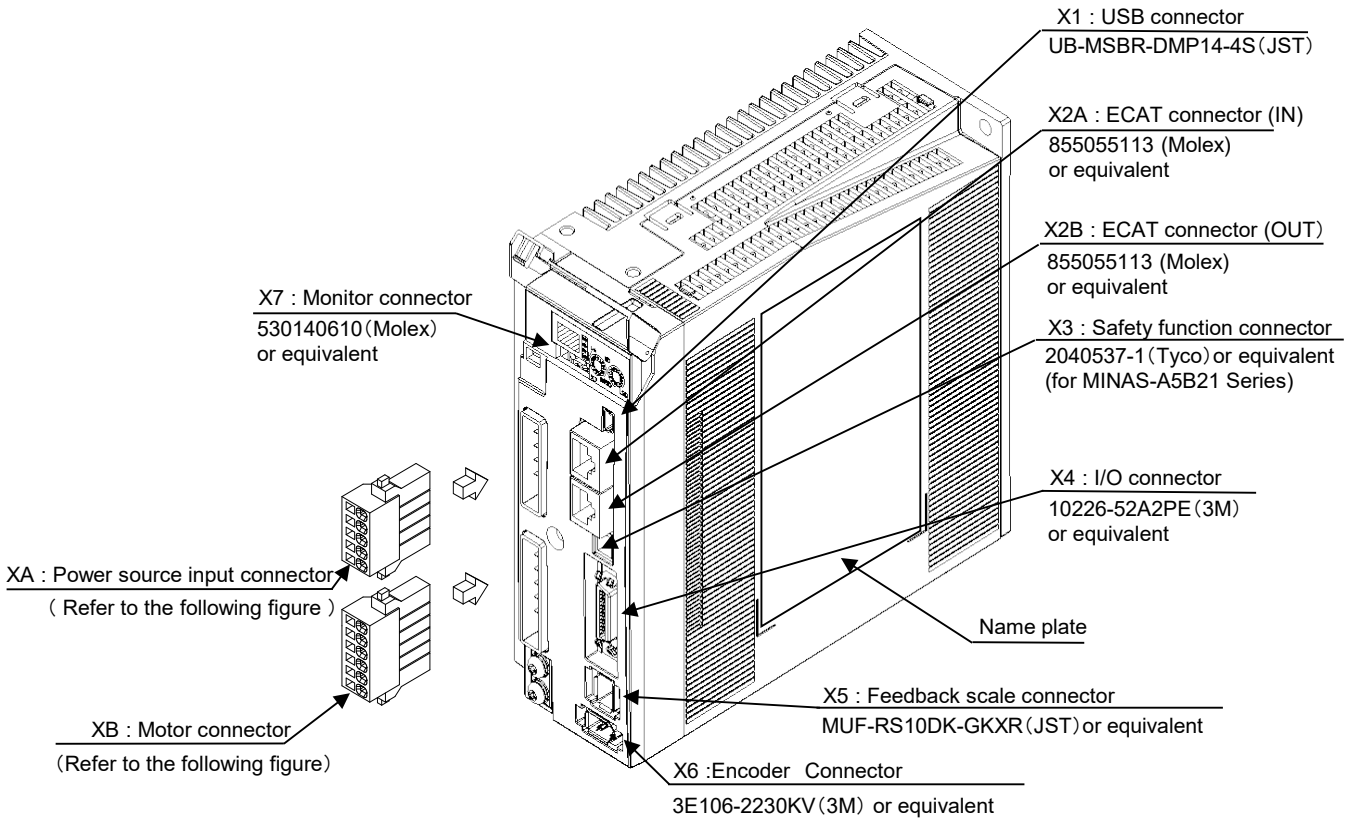
Cable side connector

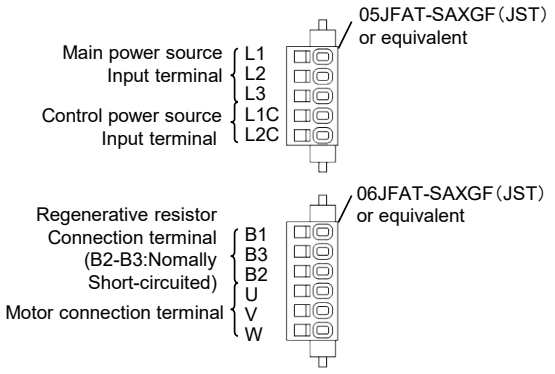


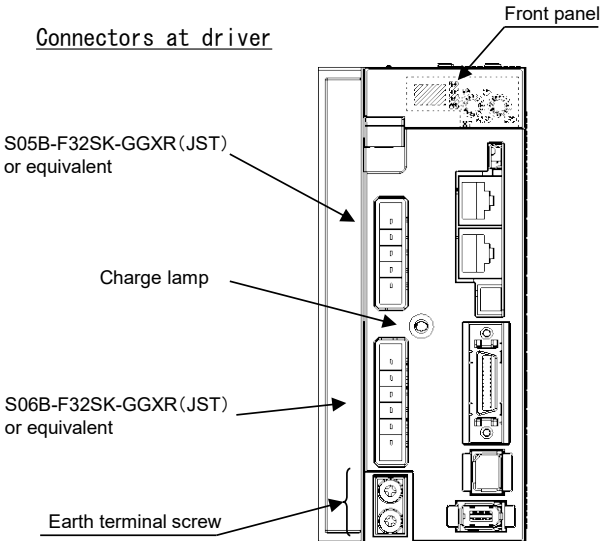
Cable side connector



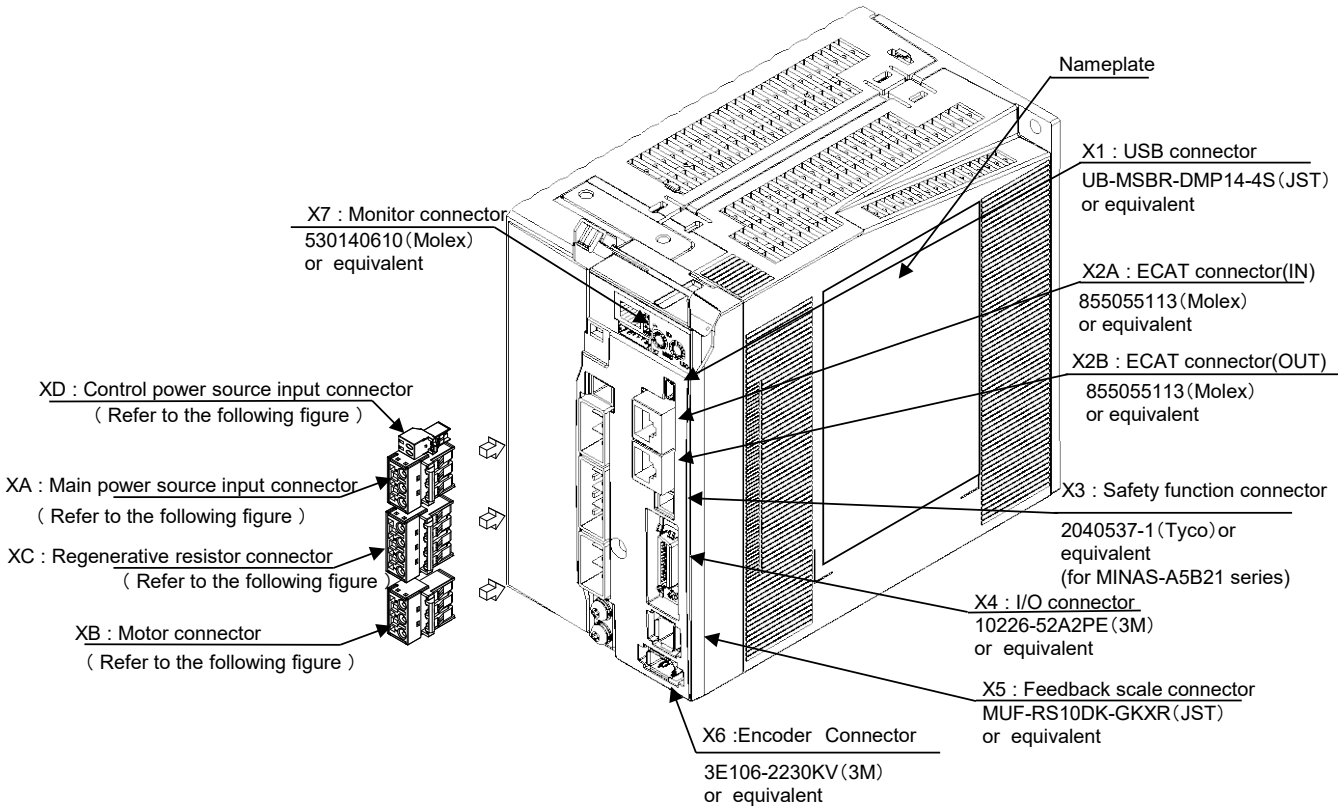
Size C, D 100 V/200 V

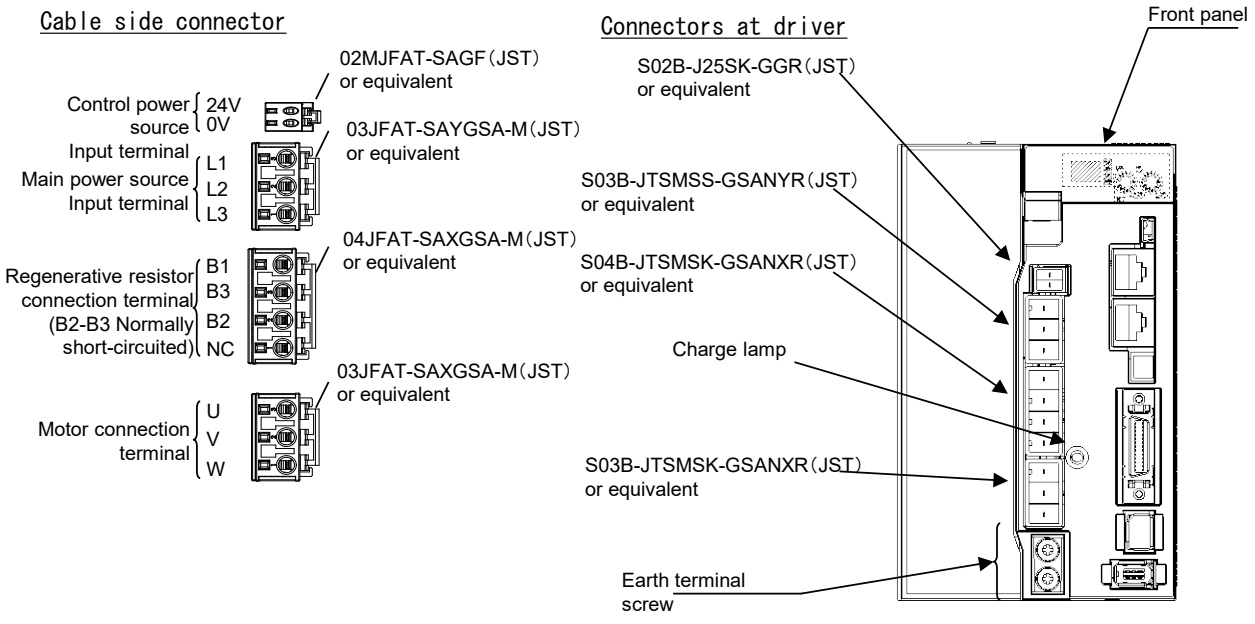




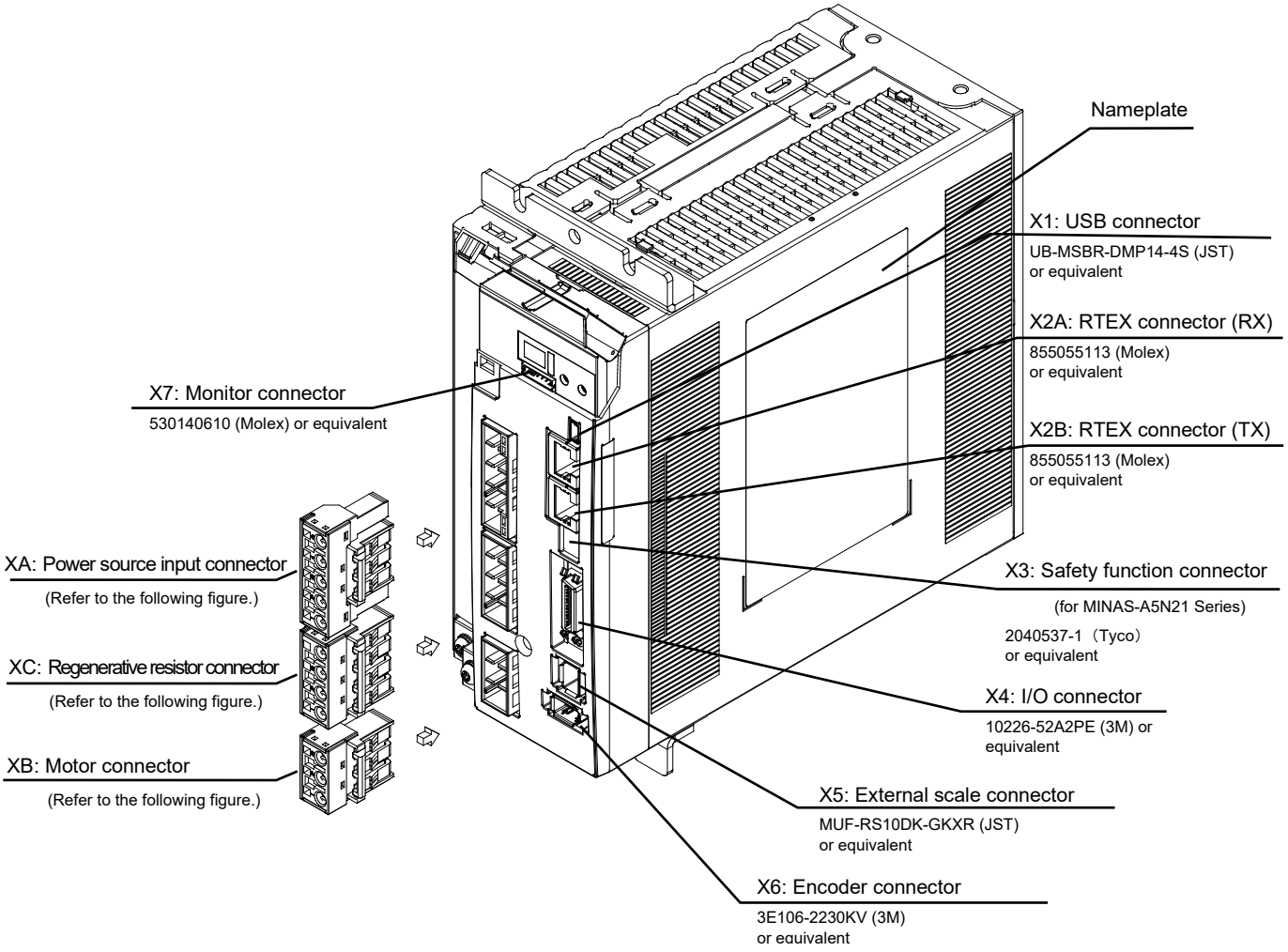


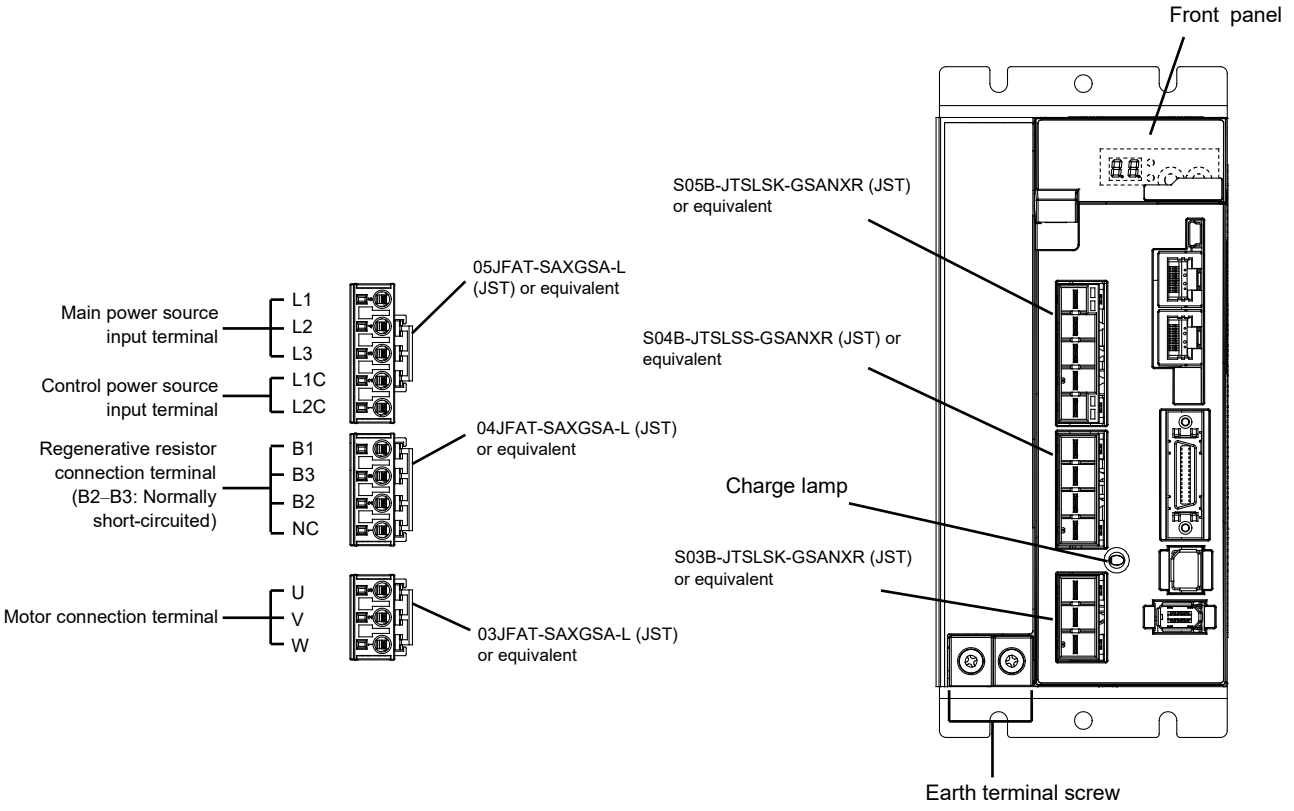
Size D 400 V


Nameplate
X1 : USB connector
UB-MSBR-DMP14-4S(JST)
or equivalent
X7 : Monitor connector
530140610(Molex)
or equivalent
X2A : ECAT connector(IN)
855055113(Molex)
or equivalent
X2B : ECAT connector(OUT)
855055113(Molex)
or equivalent
XD : Control power source input connector
(Refer to the following figure)
XA : Main power source input connector
(Refer to the following figure)
XC : Regenerative resistor connector
(Refer to the following figure
XB : Motor connector
(Refer to the following figure)
X3 : Safety function connector
2040537-1(Tyco)or
equivalent
(for MINAS-A5B21 series)
X4 : I/O connector
10226-52A2PE(3M)
or equivalent
X5 : Feedback scale connector
MUF-RS10DK-GKXR(JST)
or equivalent
X6 :Encoder Connector
3E106-2230KV(3M)
or equivalent

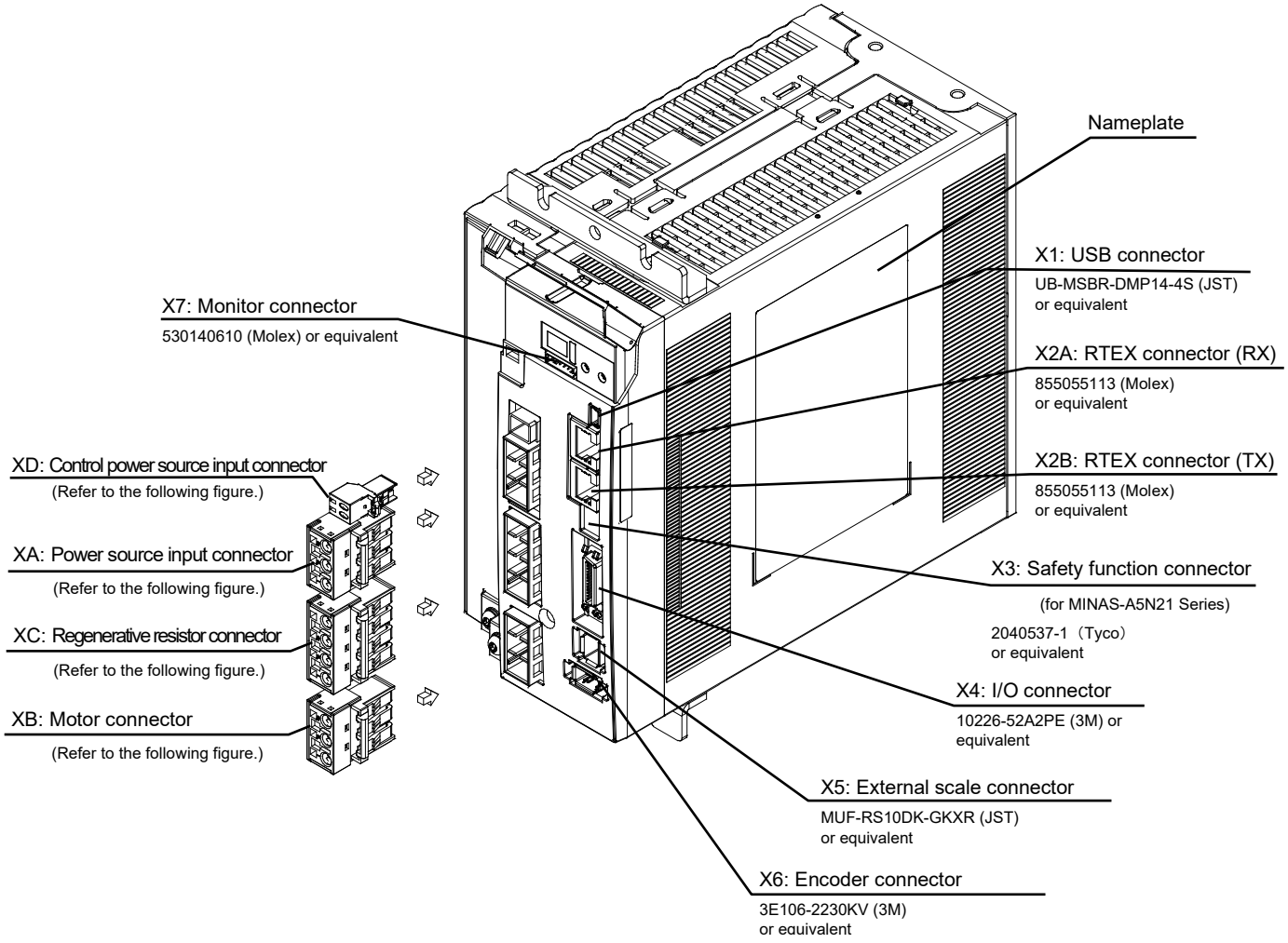

Cable side connector
02MJFAT-SAGF(JST)
or equivalent
Control power source 24V 0V
03JFAT-SAYGSA-M(JST)
or equivalent
Input terminal
Main power source Input terminal L1 L2 L3
04JFAT-SAXGSA-M(JST)
or equivalent
Regenerative resistor connection terminal (B2-B3 Normally short-circuited) B1 B3 B2 NC
03JFAT-SAXGSA-M(JST)
or equivalent
Motor connection terminal U V W
Connectors at driver
Front panel
S02B-J25SK-GGR(JST)
or equivalent
S03B-JTSMSS-GSANYR(JST)
or equivalent
S04B-JTSMSK-GSANXR(JST)
or equivalent
Charge lamp
S03B-JTSMSK-GSANXR(JST)
or equivalent
Earth terminal screw

Size E 200 V

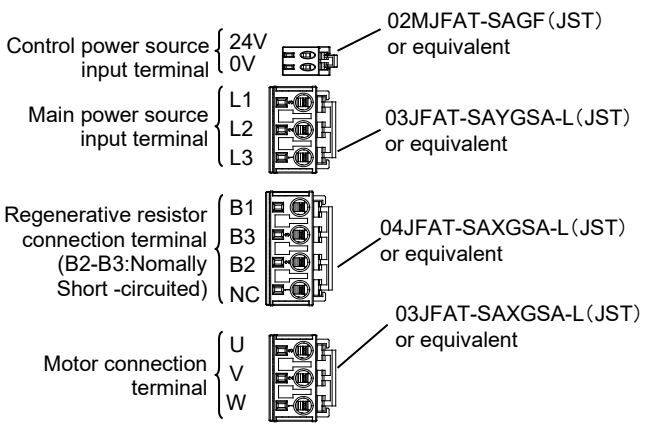

Nameplate
X1: USB connector
UB-MSBR-DMP14-4S (JST)
or equivalent
X2A: RTEX connector (RX)
855055113 (Molex)
or equivalent
X2B: RTEX connector (TX)
855055113 (Molex)
or equivalent
X7: Monitor connector
530140610 (Molex) or equivalent
XA: Power source input connector
(Refer to the following figure.)
XC: Regenerative resistor connector
(Refer to the following figure.)
XB: Motor connector
(Refer to the following figure.)
X3: Safety function connector
(for MINAS-A5N21 Series)
2040537-1（Tyco）
or equivalent
X4: I/O connector
10226-52A2PE (3M) or
equivalent
X5: External scale connector
MUF-RS10DK-GKXR (JST)
or equivalent
X6: Encoder connector
3E106-2230KV (3M)
or equivalent


Front panel
S05B-JTSLSK-GSANXR (JST)
or equivalent
S04B-JTSLSS-GSANXR (JST) or
equivalent
Charge lamp
S03B-JTSLSK-GSANXR (JST)
or equivalent
Earth terminal screw
Main power source
input terminal
L1
L2
L3
Control power source
input terminal
L1C
L2C
Regenerative resistor
connection terminal
(B2–B3: Normally
short-circuited)
B1
B3
B2
NC
Motor connection terminal
U
V
W
05JFAT-SAXGSA-L
(JST) or equivalent
04JFAT-SAXGSA-L (JST)
or equivalent
03JFAT-SAXGSA-L (JST)
or equivalent

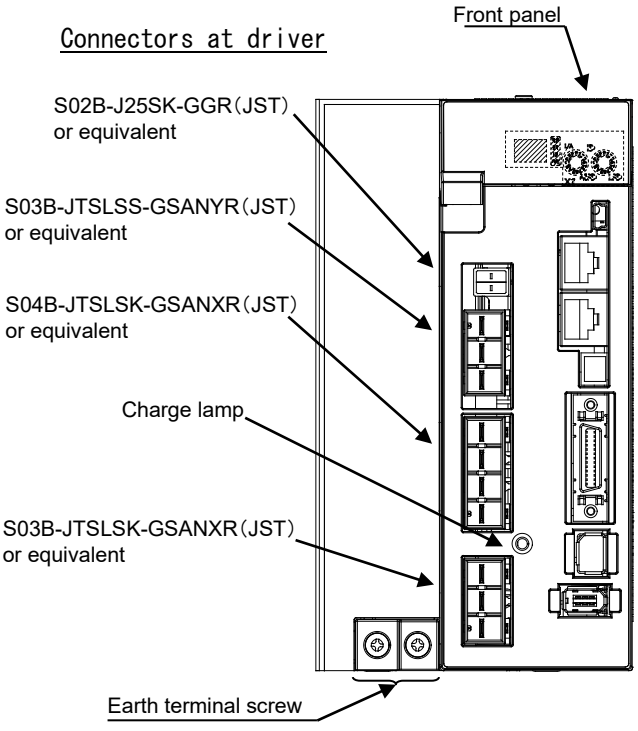
Size E 400 V



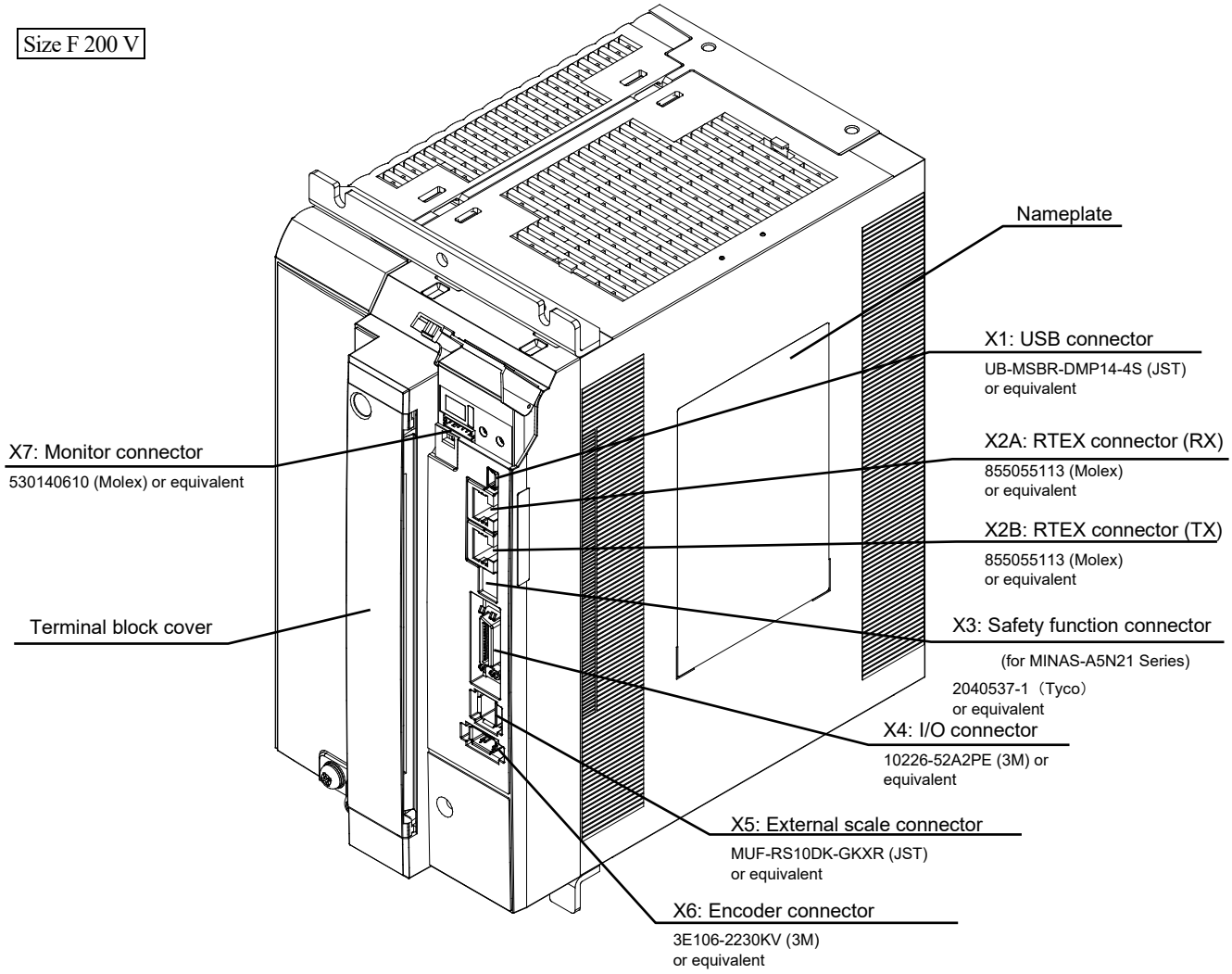
Cable side connector

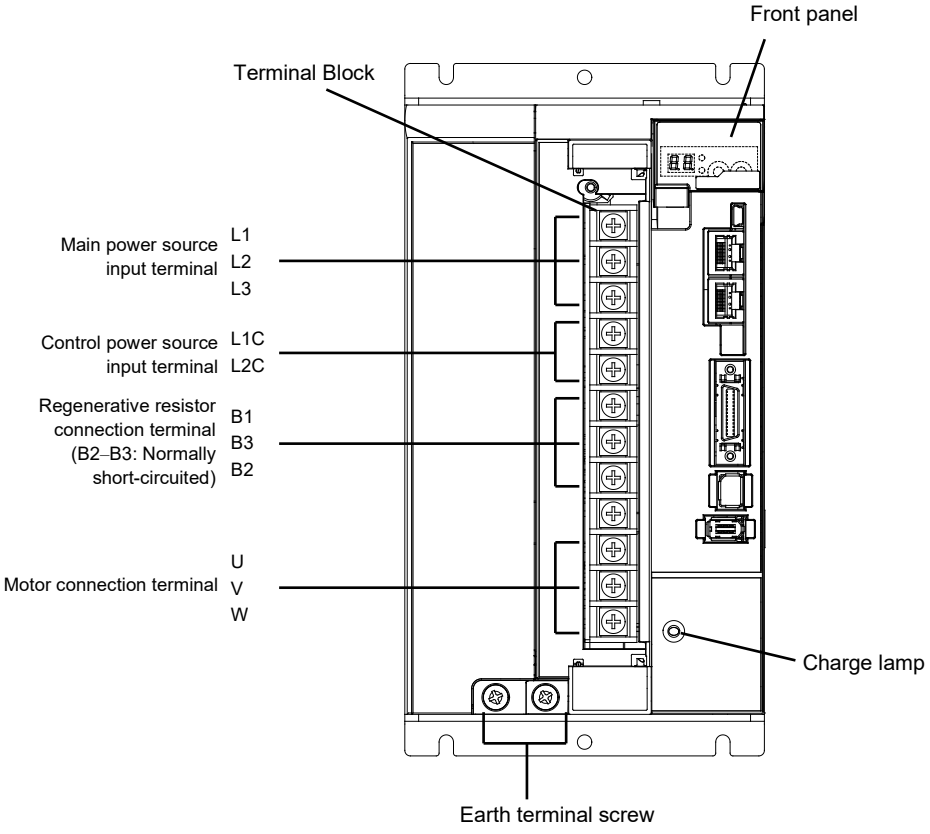


Connectors at driver



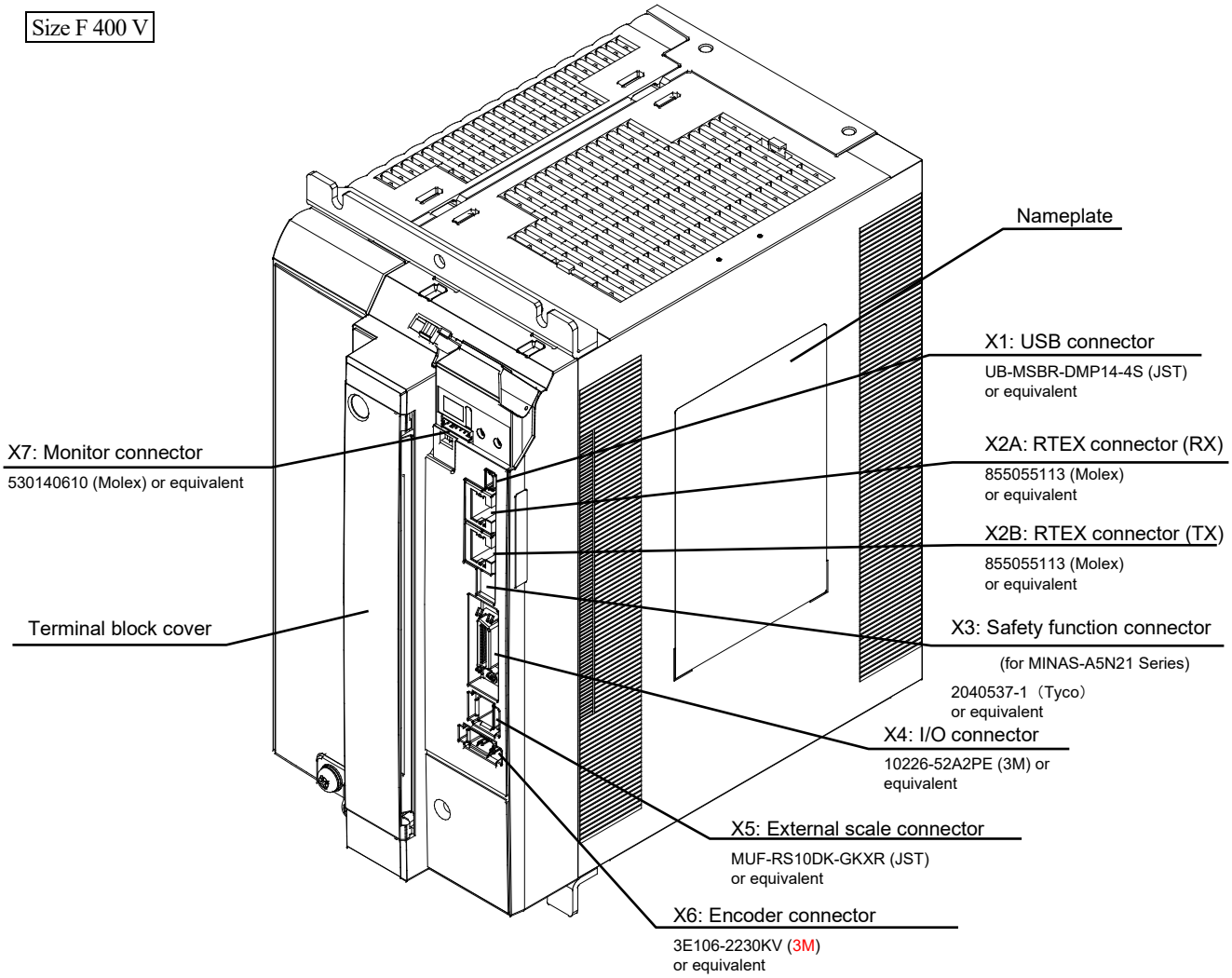
Size F 200 V

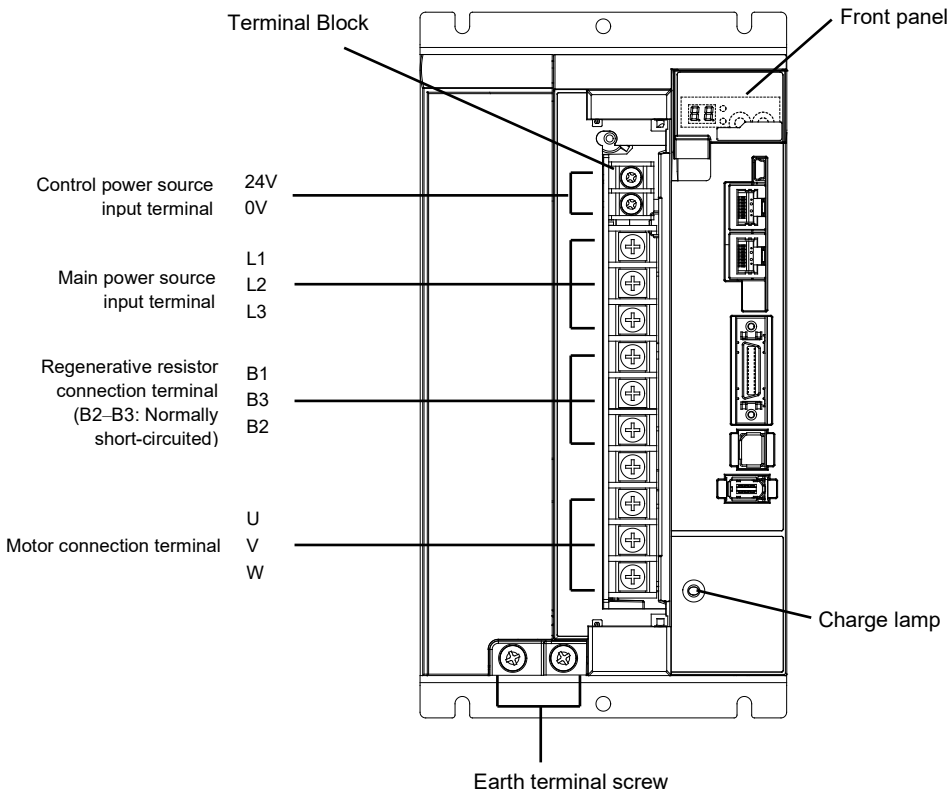




Note: Terminal block with the cover removed

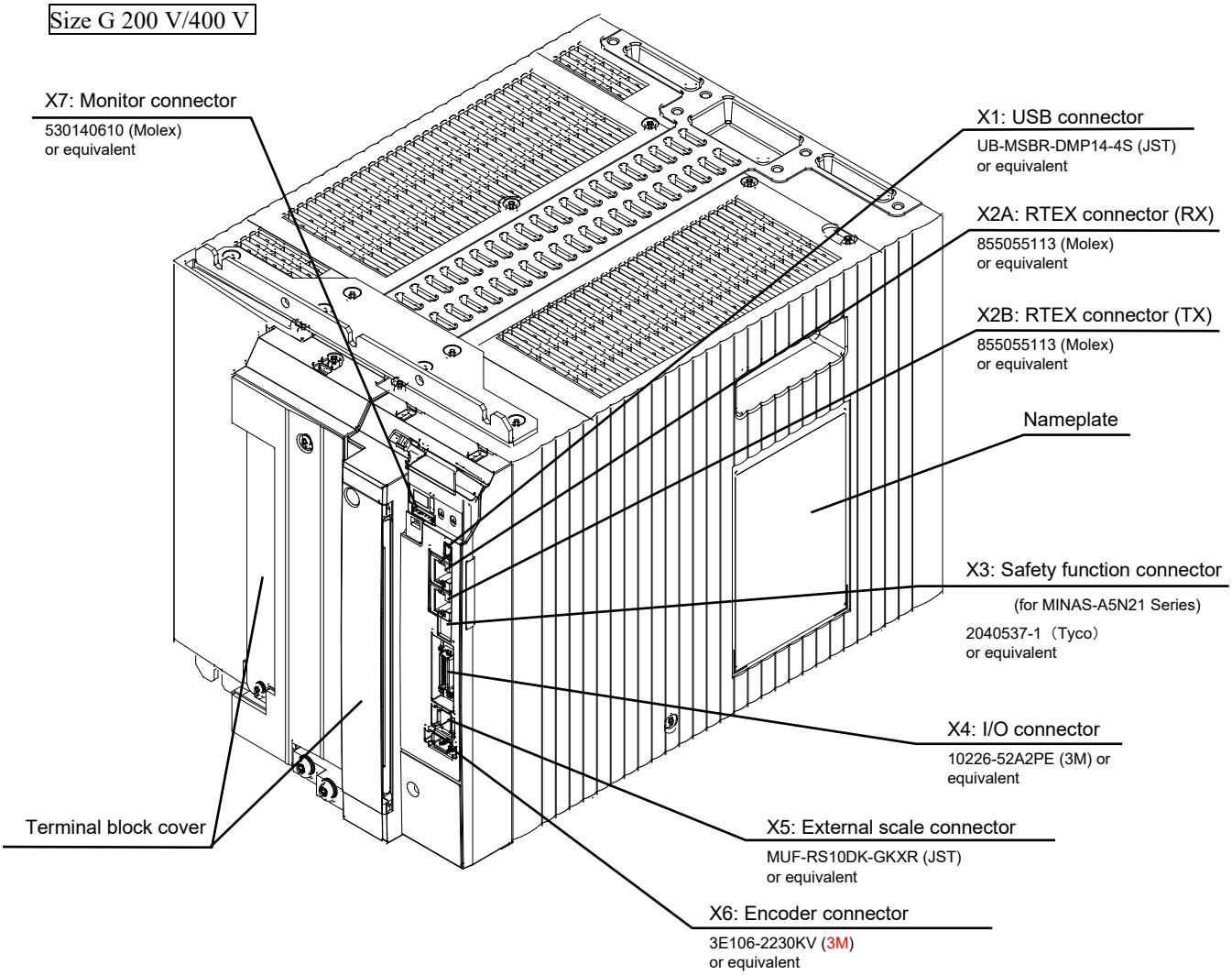
Size F 400 V

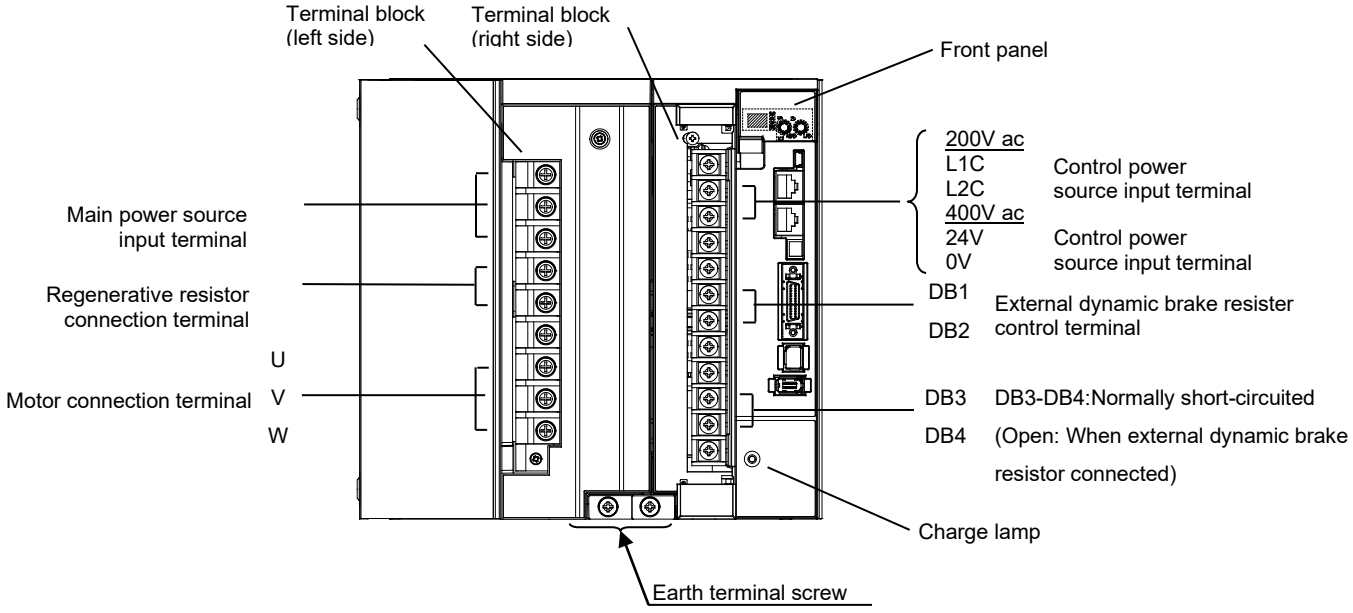




Note: Terminal block with the cover removed

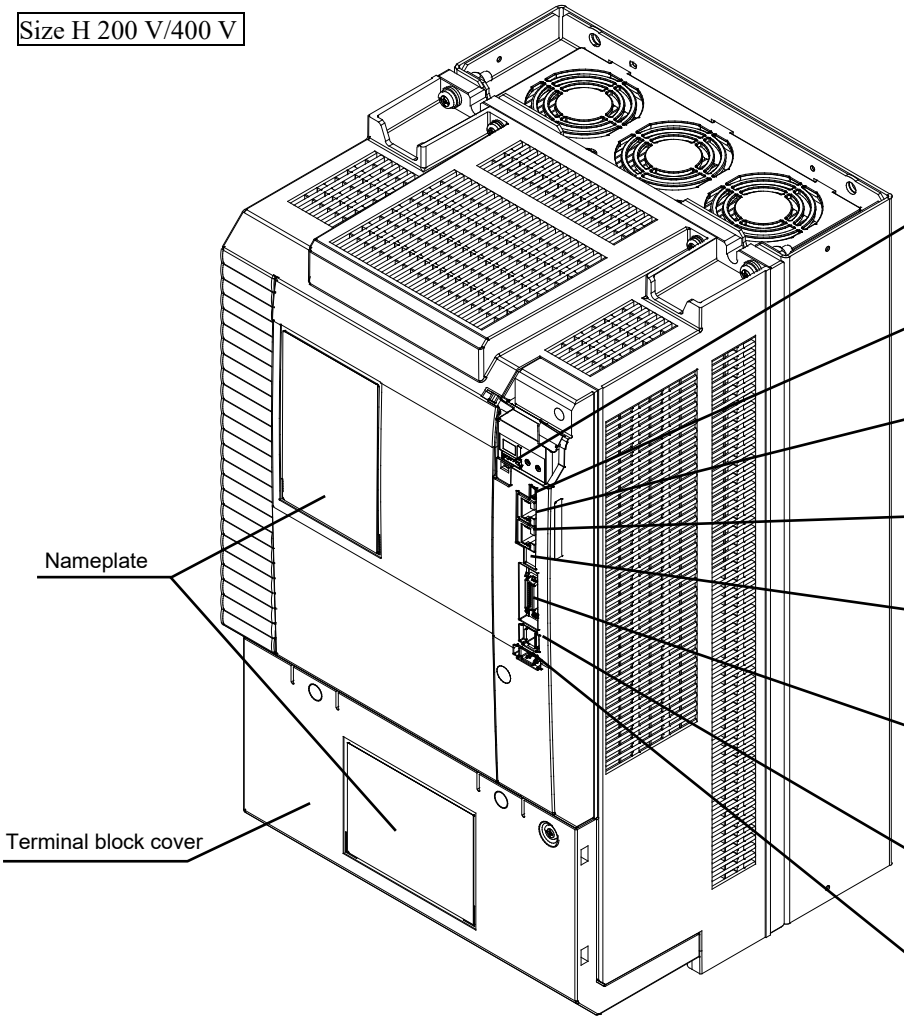
Size G 200 V/400 V





Note: Terminal block with the cover removed

Size H 200 V/400 V



X7: Monitor connector
530140610 (Molex)
or equivalent

X1: USB connector
UB-MSBR-DMP14-4S (JST)
or equivalent

X2A: RTEX connector (RX)
855055113 (Molex)
or equivalent

X2B: RTEX connector (TX)
855055113 (Molex)
or equivalent

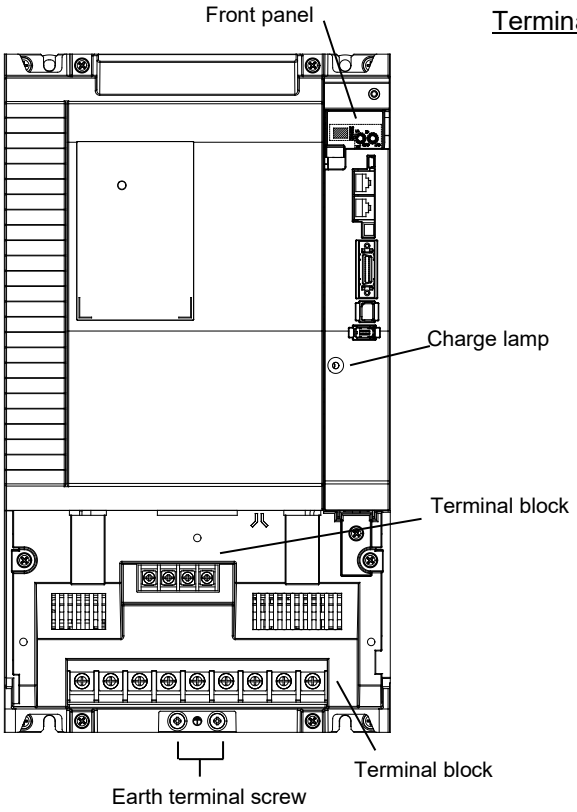
X3: Safety function connector
(for MINAS-A5N21 Series)
2040537-1（Tyco）
or equivalent

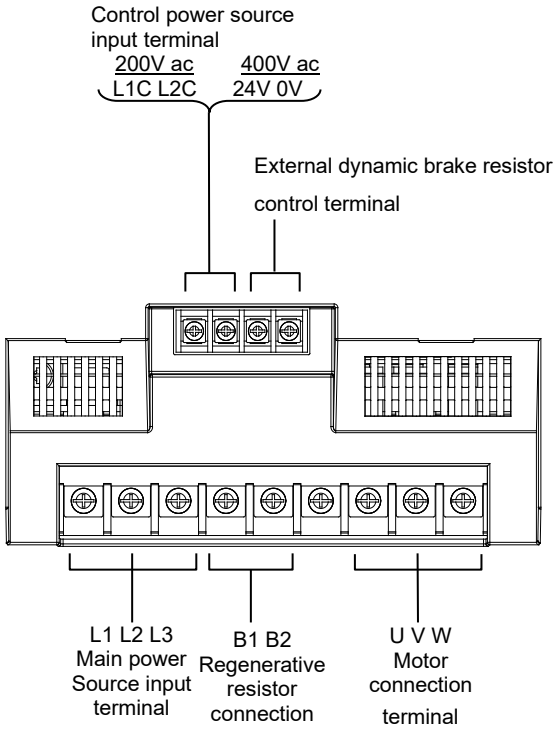
X4: I/O connector
10226-52A2PE (3M) or
equivalent

X5: External scale connector
MUF-RS10DK-GKXR (JST) or
equivalent

X6: Encoder connector
3E106-2230KV (3M)
or equivalent

Terminal block





Note: Terminal block with the cover removed

7. Configuration of Connectors and Terminal Blocks

7-1 Power Connector XA , XB , XC , XD and Terminal Block

[1] Sizes A, B, C and D of 100 V and 200 V System

	Name	Terminal symbol	Connector pin no.	Description	
XA	Main power supply input	L1	5	100 V	Single phase 100–120 V +10% -15% 50/60 Hz input Use L1 and L3 terminal.
		L2	4	200 V	Single or 3 phase 200–240 V +10% -15% 50/60 Hz input Use L1 and L3 terminal for single phase input
		L3	3		
	Control power supply input	L1C	2	100 V	Single phase 100–120 V +10% -15% 50/60 Hz input
		L2C	1	200 V	Single phase 200–240 V +10% -15% 50/60 Hz input
XB	Regen resistor connection	B1	6	• Normally, open the circuit between B2 and B3. (Sizes A, B) • Normally, short out the circuit between B2 and B3. (Sizes C, D) • When a trip happens due to a regenerative load protection error, connect an external regenerative resistor (prepared by customer) between B1 and B2.	
		B3	5		
		B2	4		
	Motor connection	U	3	Connect each phase of the motor winding. U: U phase V: V phase W: W phase	
		V	2		
		W	1		
	Earth	⏚	–	There are 2 grounding terminals. Connect the one terminal to ground, and the other to the E terminal of a motor. Do not connect more than one wire to a grounding terminal.	

• Refer to section 9-3 for the tightening torque of the screw.

[2] Size E of 200 V System

	Name	Terminal symbol	Connector pin no.	Description	
XA	Main power supply input	L1	5	200 V	3 phase 200–230 V +10% -15% 50/60 Hz input
		L2	4		
		L3	3		
	Control power supply input	L1C	2	200 V	Single phase 200–230 V +10% -15% 50/60 Hz input
		L2C	1		
XC	Regen resistor connection	B1	4	Normally, short out the circuit between B2 and B3. When a trip happens due to a regenerative load protection error, connect an external regenerative resistor (prepared by customer) between B1 and B2. Note: Keep NC terminal unconnected.	
		B3	3		
		B2	2		
		NC	1		
XB	Motor connection	U	3	Connect each phase of the motor winding. U: U phase V: V phase W: W phase	
		V	2		
		W	1		
	Earth	⏚	–	There are 2 grounding terminals. Connect the one terminal to ground, and the other to the E terminal of a motor. Do not connect more than one wire to a grounding terminal.	

• Refer to section 9-3 for the tightening torque of the screw.

[3] Size D and E of 400 V System

	Name	Terminal symbol	Connector pin no.	Description
XA	Main power supply input	L1	3	3 phase 380–480 V +10% -15% 50/60 Hz input
		L2	2	
		L3	1	
XD	Control power supply input	24V	1	24 V dc +/- 15%
		0V	2	
XC	Regen resistor connection	B1	4	Normally, short out the circuit between B2 and B3. When a trip happens due to a regenerative load protection error, connect an external regenerative resistor (prepared by customer) between B1 and B2. Note: Keep NC terminal unconnected.
		B3	3	
		B2	2	
		NC	1	
XB	Motor connection	U	3	Connect each phase of the motor winding. U: U phase V: V phase W: W phase
		V	2	
		W	1	
	Earth	⏚	–	There are 2 grounding terminals. Connect the one terminal to ground, and the other to the E terminal of a motor. Do not connect more than one wire to a grounding terminal.

• Refer to section 9-3 for the tightening torque of the screw.

[4] Size F of 200 V System

	Name	Terminal symbol	Terminal no. (upper to bottom)	Description
Terminal block	Main power supply input	L1	1	3 phase 200–230 V +10% -15% 50/60 Hz input
		L2	2	
		L3	3	
	Control power supply input	L1C	4	Single phase 200–230 V +10% -15% 50/60 Hz input
		L2C	5	
	Regen resistor connection	B1	6	Normally, short out the circuit between B2 and B3. When a trip happens due to a regenerative load protection error, open the circuit between B2 and B3 and connect an external regenerative resistor (prepared by customer) between B1 and B2. Note: Keep NC terminal unconnected.
		B3	7	
		B2	8	
		NC	9	
	Motor connection	U	10	Connect each phase of the motor winding. U: U phase V: V phase W: W phase
		V	11	
		W	12	
	Earth	⏚	–	There are 2 grounding terminals. Connect the one terminal to ground, and the other to the E terminal of a motor. Do not connect more than one wire to a grounding terminal.

• Refer to section 9-3 for the tightening torque of the screw.
• Tighten the fixing screw of the terminal block cover with a torque 0.19 - 0.21 N·m or lower.

[5] Size F of 400 V System

	Name	Terminal symbol	Terminal no. (upper to bottom)	Description
Terminal block	Control power supply input	24V	1	24 V dc +/- 15%
		0V	2	
Terminal block	Main power supply input	L1	1	3 phase 380–480 V + 10% - 15% 50/60 Hz input
		L2	2	
		L3	3	
	Regen resistor connection	B1	4	Normally, short out the circuit between B2 and B3. When a trip happens due to a regenerative load protection error, open the circuit between B2 and B3 and connect an external regenerative resistor (prepared by customer) between B1 and B2. Note: Keep NC terminal unconnected.
		B3	5	
		B2	6	
		NC	7	
	Motor connection	U	8	Connect each phase of the motor winding. U: U phase V: V phase W: W phase
		V	9	
		W	10	
	Earth	⏚	–	There are 2 grounding terminals. Connect the one terminal to ground, and the other to the E terminal of a motor. Do not connect more than one wire to a grounding terminal.

- Refer to section 9-3 for the tightening torque of the screw.
- Tighten the fixing screw of the terminal block cover with a torque 0.19 - 0.21 N・m or lower.

[6] Size G of 200 V and 400 V System

	Name	Terminal symbol		Terminal no. (upper to bottom)	Description
		200 V	400 V		
Terminal block (left side)	Main power supply input	L1	L1	1	200 V : 3 phase 200–230 V + 10% - 15% 50/60 Hz input
		L2	L2	2	
		L3	L3	3	400 V : 3 phase 380–480 V + 10% - 15% 50/60 Hz input
	Regenerative resistor connection	B1	B1	4	• When tripped by a regenerative load protect error, connect an external regenerative resistor (the value set by parameter and prepared by the user) across B1 and B2. Note: Keep NC terminal unconnected.
		B2	B2	5	
		NC	NC	6	
	Motor connection	U	U	7	• Connect each phase of the motor winding. U: U phase V: V phase W: W phase
		V	V	8	
		W	W	9	
Terminal block (right side)		NC	NC	1	• Leave this terminal unconnected.
	Control power supply input	L1C	24V	2	200 V : Single phase 200–230 V + 10% - 15% 50/60 Hz input
		L2C	0V	3	400 V : 24 V dc +/- 15%
		NC	NC	4	• Leave this terminal unconnected.
		NC	NC	5	
	Dynamic brake resistor control terminal	DB1	DB1	6	• Connect when it is necessary to control the MC for external dynamic brake resistor (prepared by the user). • Impress the voltage AC300V or less or DC100V or less between DB1 and DB2.
		DB2	DB2	7	
		NC	NC	8	• Leave this terminal unconnected.
		NC	NC	9	
	Dynamic brake resistor control terminal	DB3	DB3	10	• Be short-circuited usually between DB3 and DB4. Remove the short bar when you use the external dynamic brake resistor.
		DB4	DB4	11	
		NC	NC	12	
	Earth	⏚		–	There are 2 grounding terminals. Connect the one terminal to ground, and the other to the E terminal of a motor. Do not connect more than one wire to a grounding terminal.

- Refer to section 9-3 for the tightening torque of the screw.
- Tighten M3 terminal block cover fixing screw with the 0.19 - 0.21 N・m. torque.

[7] Size H of 200 V and 400 V System

	Name	Terminal symbol		Terminal no. (left to right)	Description
		200 V	400 V		
Terminal block (upper side)	Control power supply input	L1C	24V	1	200 V : Single phase 200–230 V + 10% - 15% 50/60 Hz input
		L2C	0V	2	400 V : 24 V dc +/- 15%
	Dynamic brake resistor control terminal	DB1	DB1	3	• Connect when it is necessary to control the MC for external dynamic brake resistor (prepared by the user). • Impress the voltage AC300V or less or DC100V or less between DB1 and DB2.
		DB2	DB2	4	
Terminal block (lower side)	Main power supply input	L1	L1	1	200 V : 3 phase 200–230 V + 10% - 15% 50/60 Hz input
		L2	L2	2	
		L3	L3	3	400 V : 3 phase 380–480 V + 10% - 15% 50/60 Hz input
	Regenerative resistor connection	B1	B1	4	• When tripped by a regenerative load protect error, connect an external regenerative resistor (the value set by parameter and prepared by the user) across B1 and B2. Note) Do not connect any wire to the NC terminal.
		B2	B2	5	
		NC	NC	6	
	Motor connection	U	U	7	Connect each phase of the motor winding. U: U phase V: V phase W: W phase
		V	V	8	
		W	W	9	
	Earth	⏚		–	There are 2 grounding terminals. Connect the one terminal to ground, and the other to the E terminal of a motor. Do not connect more than one wire to a grounding terminal.

- Refer to section 9-3 for the tightening torque of the screw.
- Tighten M5 terminal block cover fixing screw with the 0.4 N•m torque.

7-2 USB Connector X1

By connecting to the PC through USB interface, various operations such as setting/changing of parameters, monitoring of control state, referencing of error/history, and saving/loading of parameters can be performed.

Name	Symbol	Connector pin no.	Description
USB signal	VBUS	1	• Communicate with a computer
	D-	2	
	D+	3	
For manufacturer use	–	4	• Do not connect
Signal ground	GND	5	• Signal ground

7-3 EtherCAT (ECAT) connectors X2A and X2B

For EtherCAT, use RJ45 connector.

Name	Symbol	Connector pin no.	Description
Transmit/Receive +	TX/RX+	1	Connect to pin 1 on the RJ45 connector of communicating node
Transmit/Receive -	TX/RX-	2	Connect to pin 2 on the RJ45 connector of communicating node
Receive/Transmit +	RX/TX+	3	Connect to pin 3 on the RJ45 connector of communicating node
Not used	-	4	Connect to pin 4 on the RJ45 connector of communicating node
Not used	-	5	Connect to pin 5 on the RJ45 connector of communicating node
Receive/Transmit -	RX/TX-	6	Connect to pin 6 on the RJ45 connector of communicating node
Not used	-	7	Connect to pin 7 on the RJ45 connector of communicating node
Not used	-	8	Connect to pin 8 on the RJ45 connector of communicating node
Frame ground	FG	Shell	Connect to shield of cable.

- Be sure to use shielded twisted pair (STP) compatible with 5e of TIA/EIA-568 or higher category.
- The final pin function for pins 1, 2, 3, and 6 are determined by Auto MDI-X.

7-4 Safety function connector X3 (for MINAS-A5B2 Series)

For the safety function connector.

Name	Symbol	Connector pin no.	Description	I/O type
Reserved	—	1	Do not connect.	——
	—	2		——
Safety input 1	SF1-	3	These are two independent circuits that turn off the operation signal to the power module to shut off the motor current.	i-1
	SF1+	4		
Safety input 2	SF2-	5		
	SF2+	6		
EDM output	EDM-	7	This is an output for monitoring the failure of the safety function.	o-2
	EDM+	8		
Frame ground	FG	Shell	Connected with protective earth terminal in the servo driver.	——

Refer to the technical document for the safety function.

7-5 I/O Connector X4

Input signal

Name	Symbol	Connector pin no.	Description	I/O type
Control signal power source	I-COM	6	• Connect to positive/negative polarity of the external power supply. • Use power supply: 12 V +/-5% to 24 V +/-5%	—
Input 1	SI1	5	• Assign functions using parameters. For details, refer to the technical data – Basic function specification –. • Range of available functions is limited. For example, external latch input EXT1 can be allocated only to SI5, EXT2 to SI6 and EXT3 to SI7. • For factory default function assignment, refer to appendix “Specification for Each Model”.	i-1
Input 2	SI2	7		i-1
Input 3	SI3	8		i-1
Input 4	SI4	9		i-1
Input 5	SI5	10		i-1
Input 6	SI6	11		i-1
Input 7	SI7	12		i-1
Input 8	SI8	13		i-1

Output signal

Name	Symbol	Connector pin no.	Description	I/O type
Output 1	SO1+ SO1-	1 2	• Assign functions using parameters. For details, refer to the technical data－Basic function specification－. • For factory default function assignment, refer to appendix “Specification for Each Model”.	o-1
Output 2	SO2+ SO2-	25 26		
Output 3	SO3+ SO3-	3 4		

Encoder backup power input

Name	Symbol	Connector pin no.	Description	I/O type
Battery input to absolute encoder	BTP-I	14	• Connect to the absolute encoder backup battery (recommended battery: Toshiba Life Style ER6V 3.6 V) BTP-I: positive, BTN-I: negative • The power necessary to store multi-turn data is supplied to the absolute encoder via BTP-0 (pin 3) and BTN-0 (pin 4) of encoder connector (X6). • Use any of the following methods to connect the battery for absolute encoder. (1) Directly connected to the motor. (2) Connected to the encoder cable. (3) Connected to this connector.	—
	BTN-I	15		

Other

Name	Symbol	Connector pin no.	Description	I/O type
Reserved	—	16 17 18 19 20 21 22 23 24	• Do not connect	—
Frame ground	FG	Shell	• Connected to the earth terminal in the servo driver.	—

7-6 External Scale Connector X5 (Not supported)

Name	Connector pin no.	Description
Power supply output for external scale	1	EX5V (Note 2) (Note 3)
	2	EX0V (Note 1)
External scale signal input / output (serial signal)	3	EXPS
	4	/EXPS
External scale signal input (A / B / Z phase signal)	5	EXA
	6	/EXA
	7	EXB
	8	/EXB
	9	EXZ
	10	/EXZ
Frame ground	Shell	FG

Note 1: EX5V power supply output for external scale is rated at 5.2 V ± 5% and 300 mA at maximum. To use an external scale with a current consumption higher than that, a preparation of an external power supply is required. Some external scales may take longer time in initialization after turning on the power.

Note 2: In case an external power supply is used for the external scale, make sure that the EX5V pin is open and no external power is supplied to the EX5V pin.

7-7 Encoder Connector X6

Name	Connector pin no.	Description
Encoder power supply output	1	E5V
	2	E0V (Note 1)
Absolute encoder battery backup output (Note 2)	3	BTP-O
	4	BTN-O
Encoder signal I/O (serial signal)	5	PS
	6	/PS
Frame ground	Shell	FG

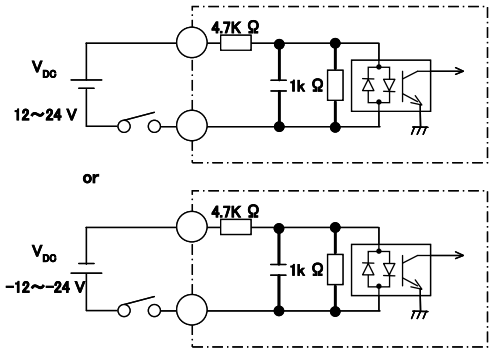
Note 1: Connected to the absolute encoder battery input terminals BTP-I and BTN-I of X4 connector in the servo driver. When connecting the battery directly to the encoder connection cable, leave these pins unconnected.

7-8 Monitor Connector X7

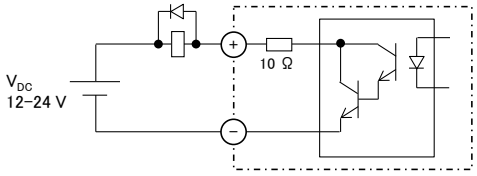
Name	Symbol	Connector pin no.	Description	I/O signal interface
Analog monitor output 1	AM1	1	• Analog signal output for monitoring • Monitoring object changes according to the parameter setting. • For details, refer to the technical document —Basic function specification—.	Ao-1
Analog monitor output 2	AM2	2		
Signal ground	GND	3	• Signal ground	——
Reserved	——	4	• Do not connect	——
Reserved	——	5	• Do not connect	——
Reserved	——	6	• Do not connect	——

I/O signal interface

i-1

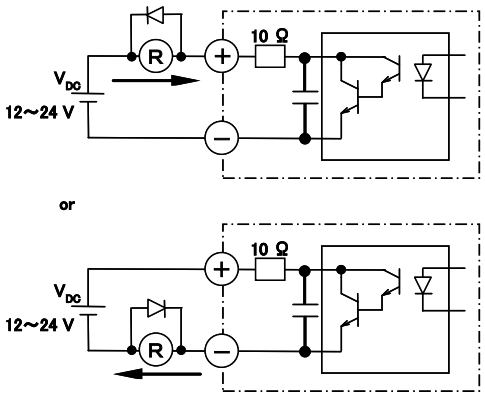


o-1



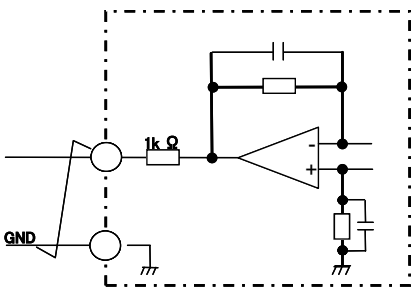
Note: To directly run the relay, attach a diode in parallel with the relay and in the direction shown in the figure above.

o- 2



Note: To directly run the relay, attach a diode in parallel with the relay and in the direction shown in the figure above.

Ao-1



Output signal amplitude is ±10V

8. Wiring

8-1 Used Cables and Maximum Cable Lengths

Name	Symbol	Maximum cable length	Used cable
Main power supply	L1, L2, L3	——	Refer to the associated specification available separately.
Control power supply	L1C, L2C	——	HVSF 0.75 mm^2
Motor connection	U, V, W, ⏚	20 m	Refer to the associated specification available separately. (Note 1)
Earth cable	⏚	1 m	Refer to the associated specification available separately.
Encoder connection	X6	20 m	Overall twisted shielded pair Core wire: 0.18 mm^2or larger
I/O connection	X4	3 m	
ECAT connection	X2A/X2B	100 m (Note 2)	Twisted shielded pair (STP) cable of category 5e or better

Note 1: When using Tyco Electronics AMP connectors (172167-1, 172189-1) as motor junction connector, maximum applicable conductor size is 1.3 mm^2.

Note 2: Refer to 8-3 (5) Connection to connectors X2A and X2B.

Note 3: The above wiring length is the maximum length in our evaluation environment and it does not guarantee the operation in the customer's use environment.

8-2 Cable Side Connector

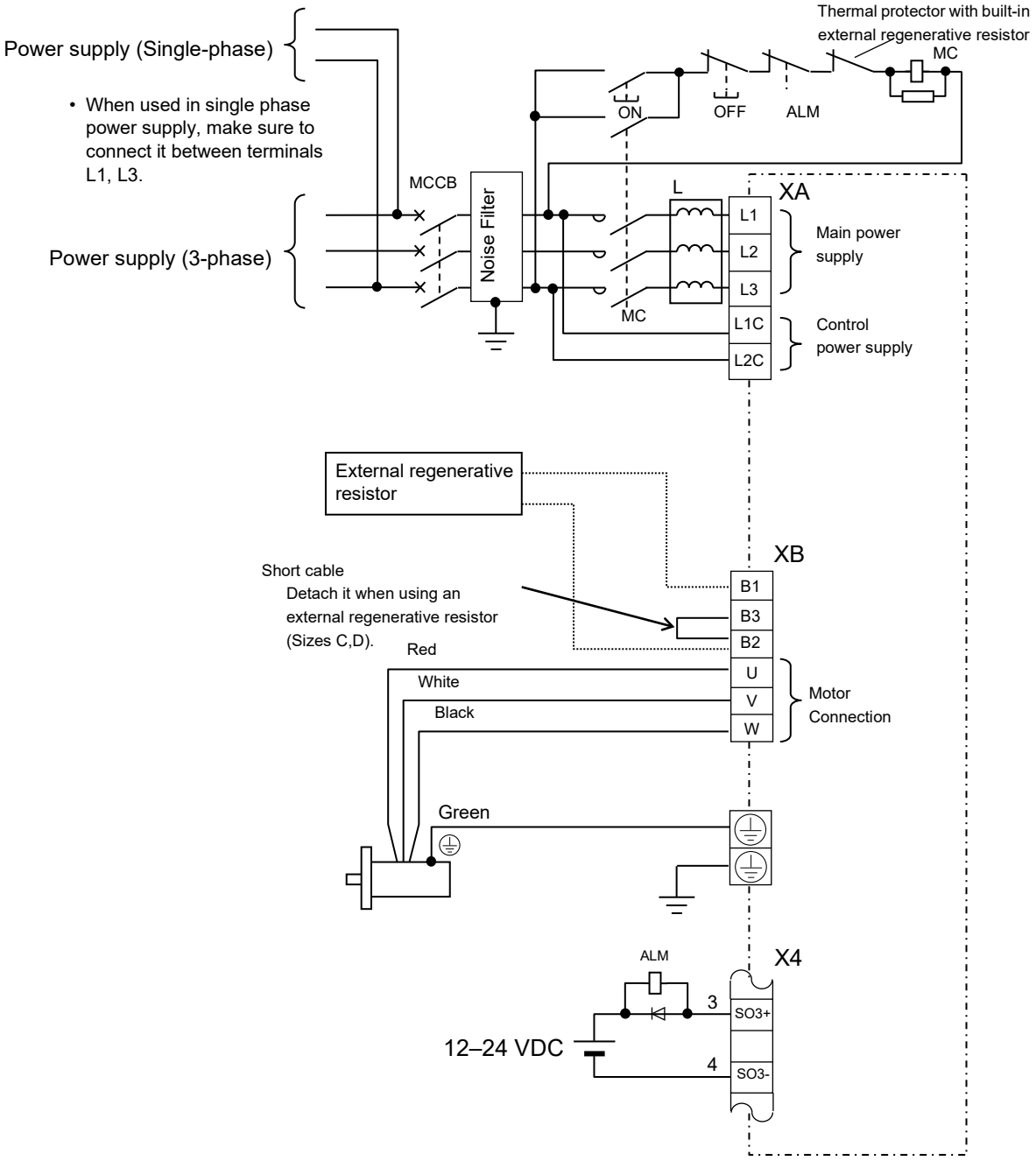
Connector symbol	Part name	Part number	Manufacturer
X3	Connector	2013595-1	Tyco Electronics
X4	Solder plug (soldering type)	10126-3000PE	3M
	Shell kit	10326-52A0-008	
X5	Connector	MUF-PK10K-X	J. S. T. Mfg
X6	Connector	3E206-0100KV	3M
		3E306-3200-008	
X7	Connector	51004-0600	Molex
	Connector pin	50011-8100	

Use connectors listed above or equivalents.

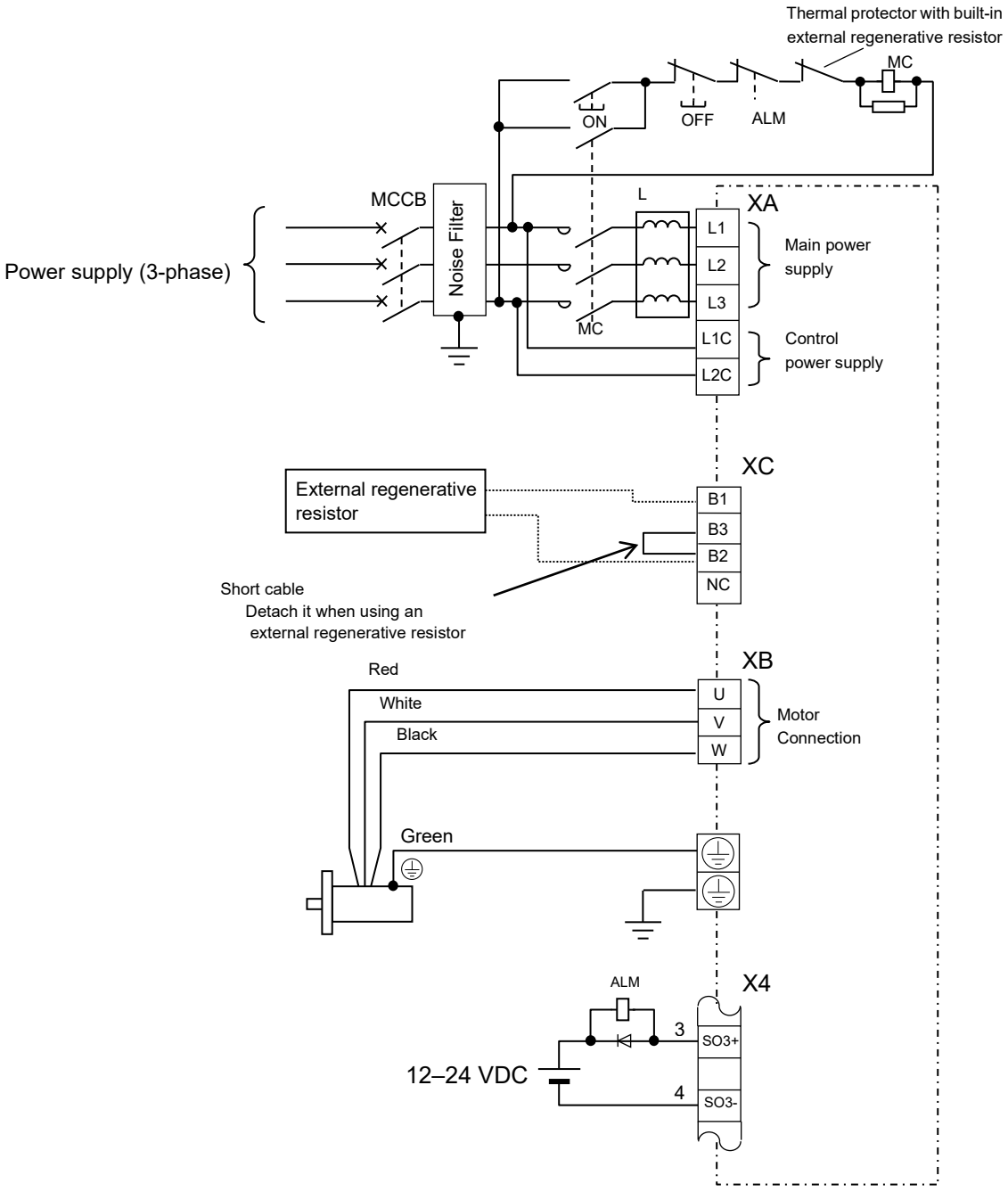
8-3 Precautions for Wiring

(1) Wiring to power connector and terminal block

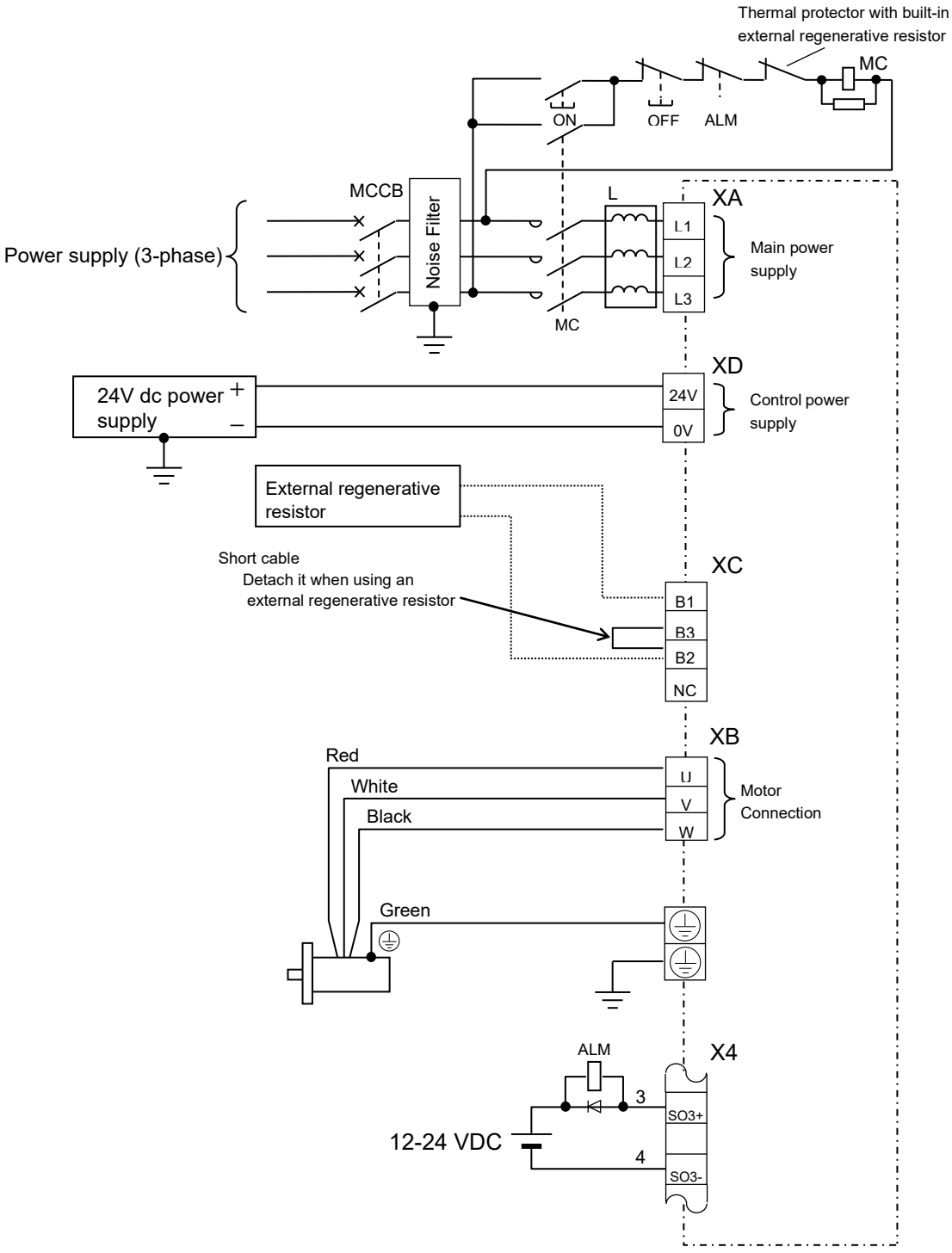
100/200 V Sizes A–D



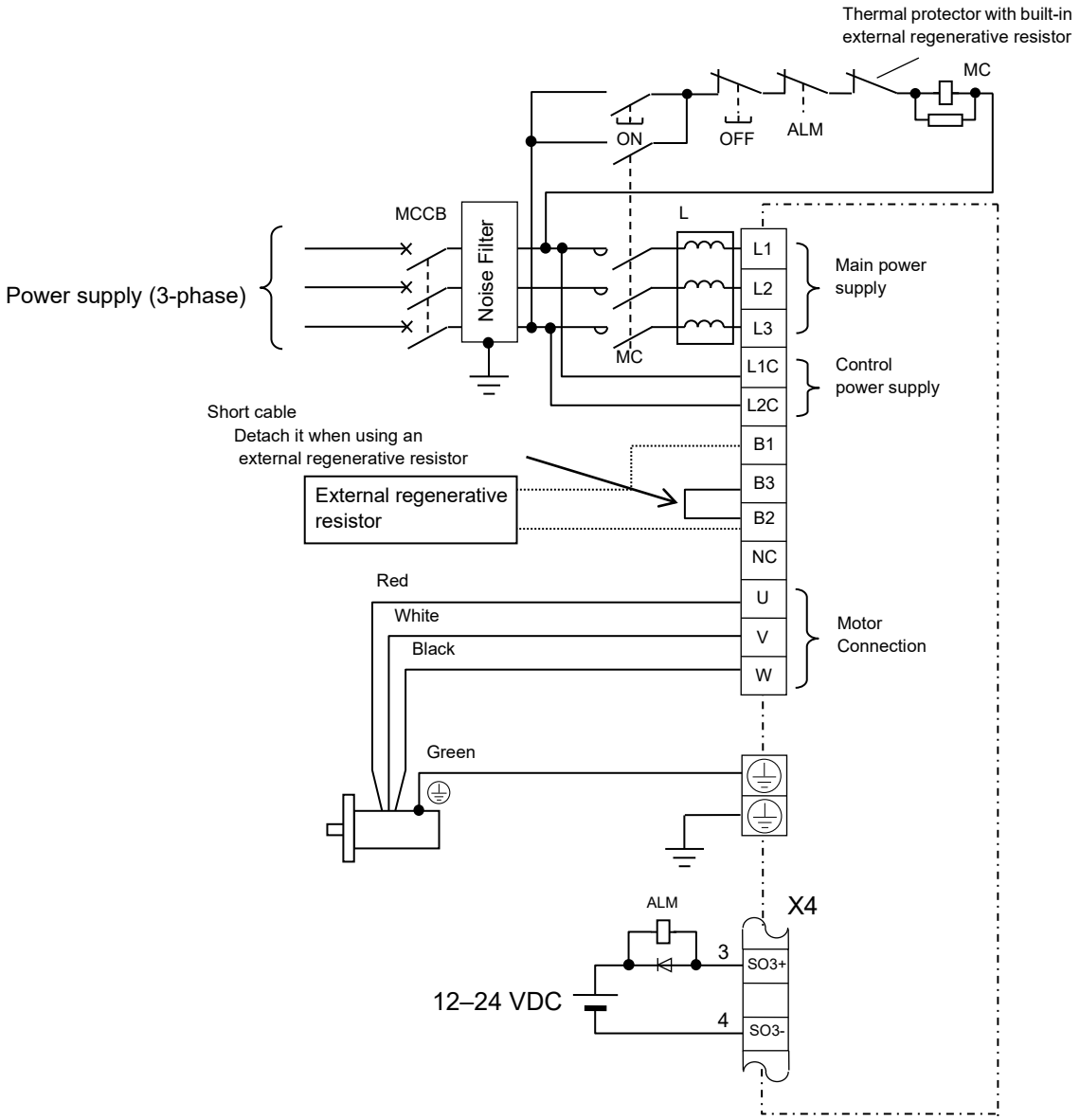
200 V Size E


Thermal protector with built-in
external regenerative resistor
MC
ON
OFF
ALM
MCCB
Noise Filter
L
XA
Power supply (3-phase)
L1
L2
L3
Main power
supply
MC
L1C
L2C
Control
power supply
XC
External regenerative
resistor
B1
B3
B2
NC
Short cable
Detach it when using an
external regenerative resistor
XB
Red
White
Black
U
V
W
Motor
Connection
Green
ALM
X4
3
SO3+
12–24 VDC
4
SO3-

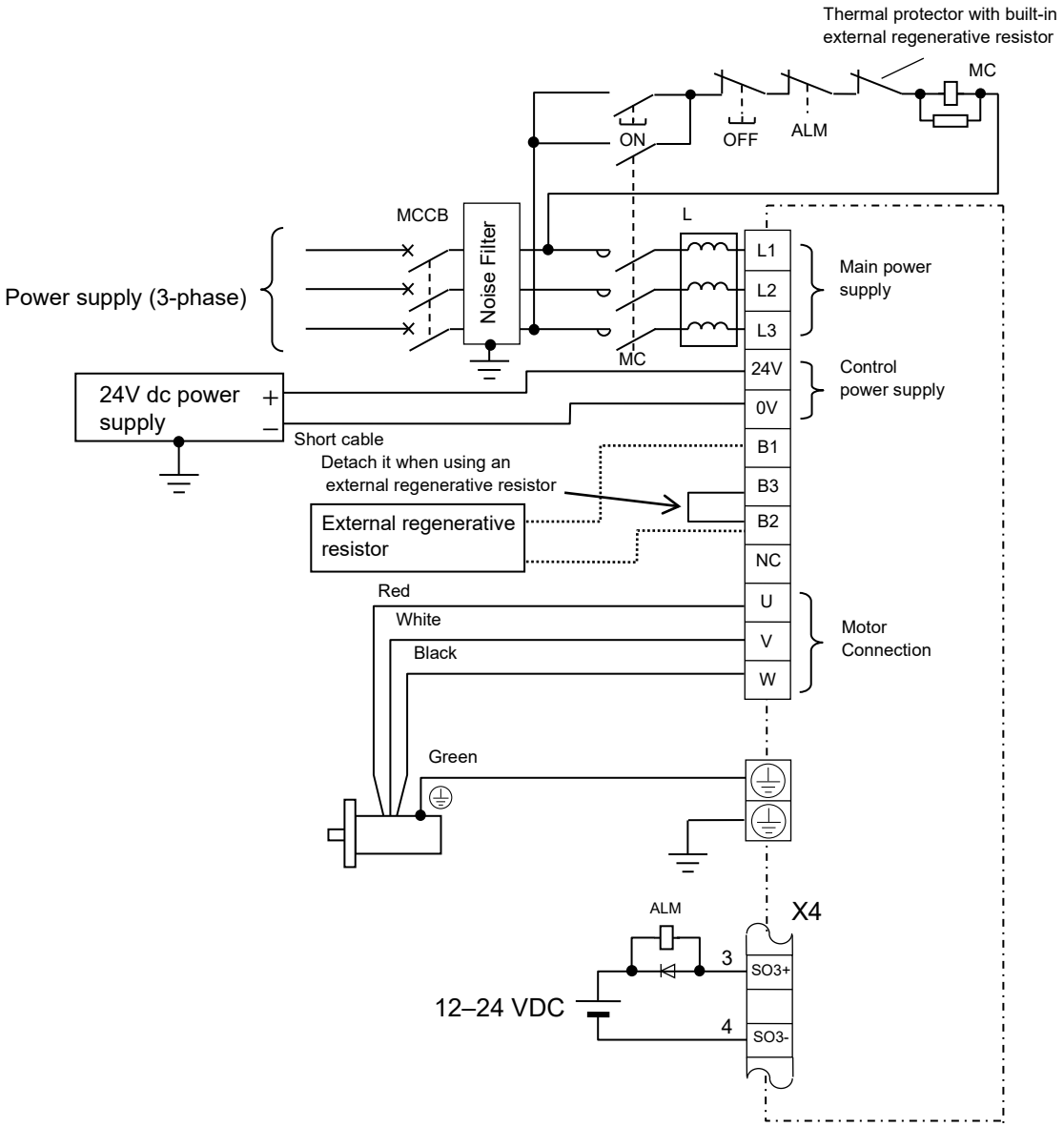
400 V Sizes D and E



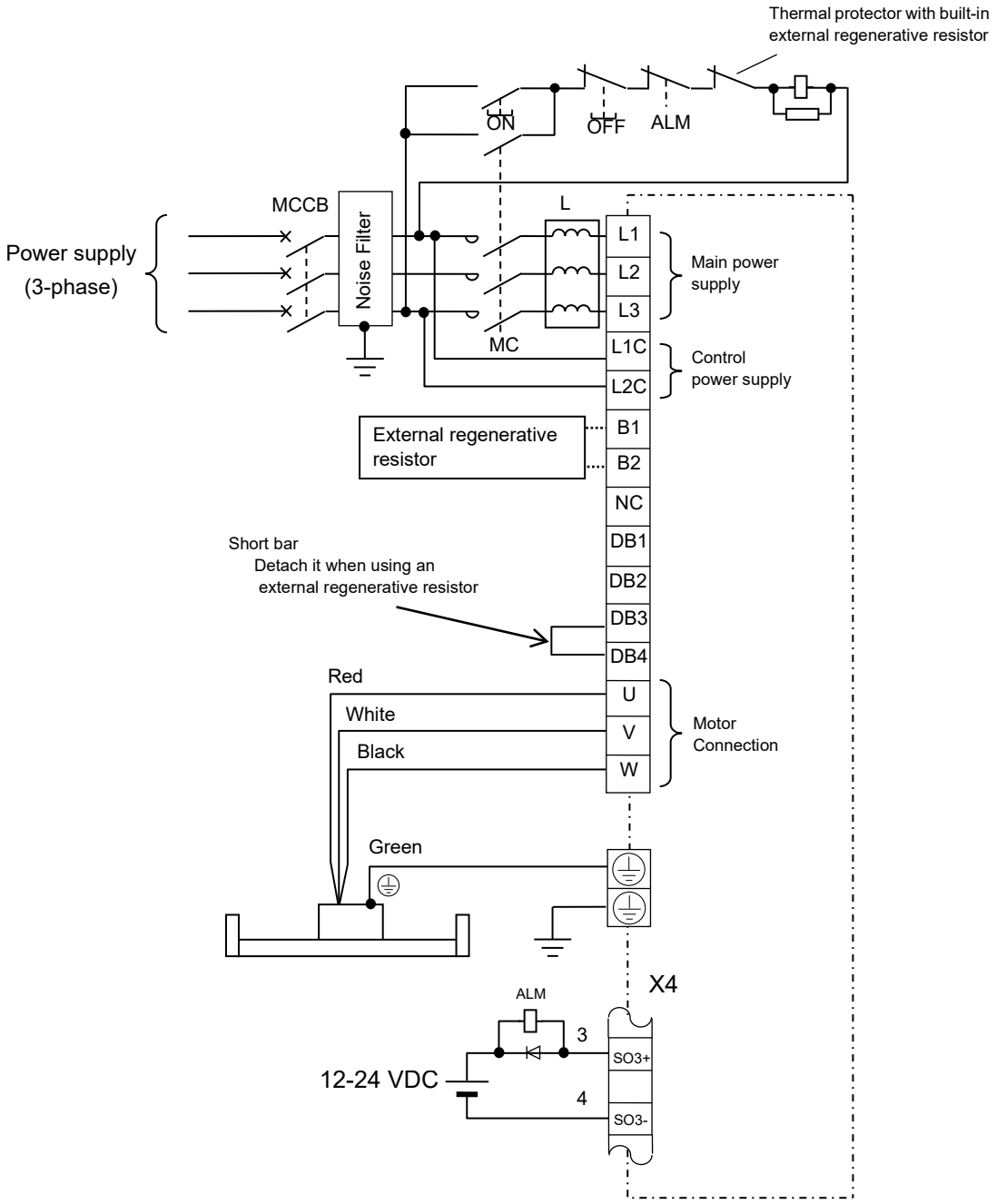
200 V Size F


Thermal protector with built-in external regenerative resistor
MC
ON
OFF
ALM
MCCB
Noise Filter
L
Power supply (3-phase)
L1
L2
L3
Main power supply
MC
L1C
L2C
Control power supply
Short cable
Detach it when using an external regenerative resistor
External regenerative resistor
B1
B3
B2
NC
Red
White
Black
U
V
W
Motor Connection
Green
ALM
X4
3
SO3+
12–24 VDC
4
SO3-

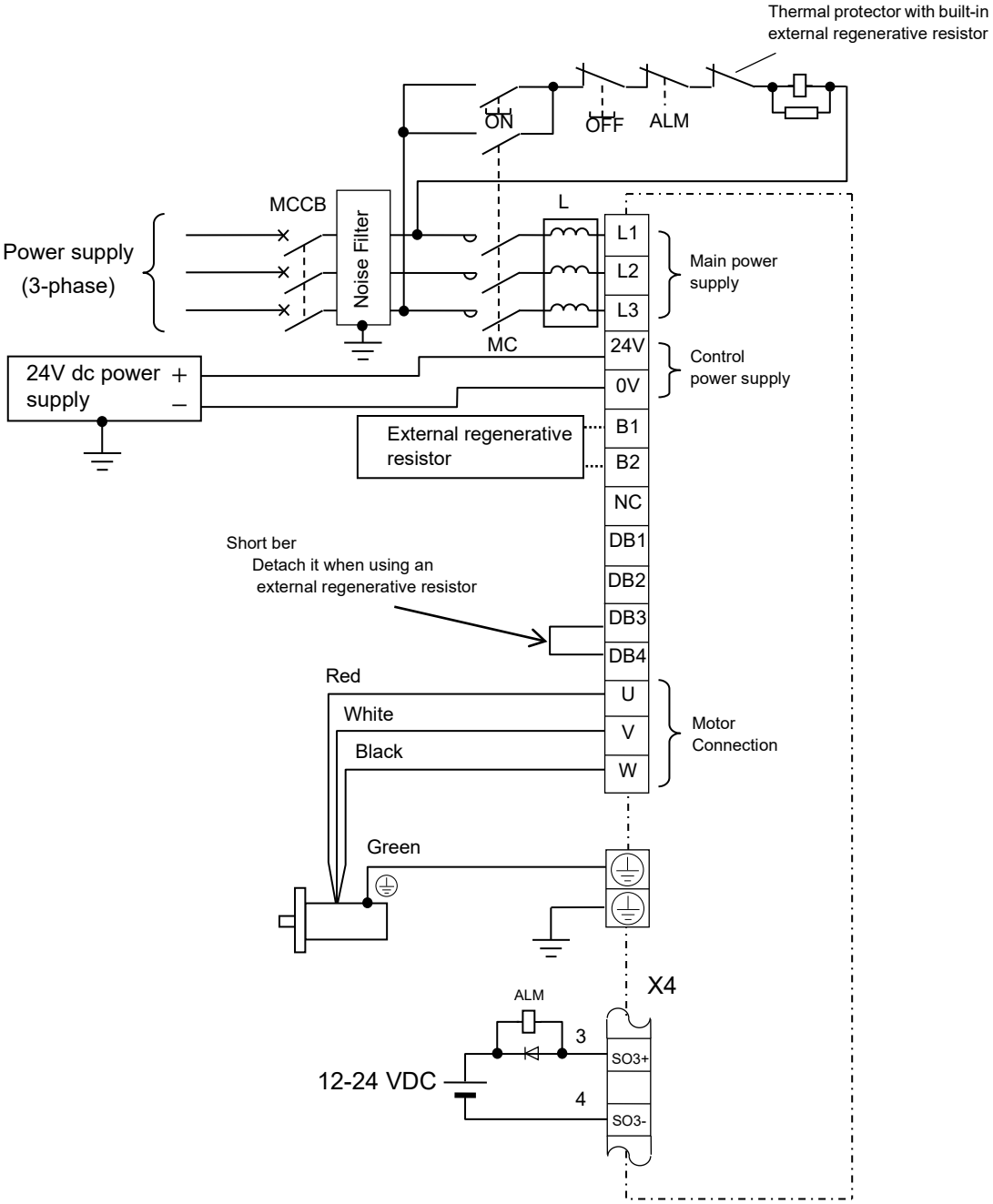
400 V Size F


Thermal protector with built-in external regenerative resistor
MC
ON
OFF
ALM
MCCB
Noise Filter
L
Power supply (3-phase)
L1
L2
L3
Main power supply
MC
24V
0V
Control power supply
24V dc power supply
+
–
Short cable
Detach it when using an external regenerative resistor
B1
B3
B2
NC
External regenerative resistor
Red
White
Black
U
V
W
Motor Connection
Green
ALM
X4
3
SO3+
12–24 VDC
4
SO3-

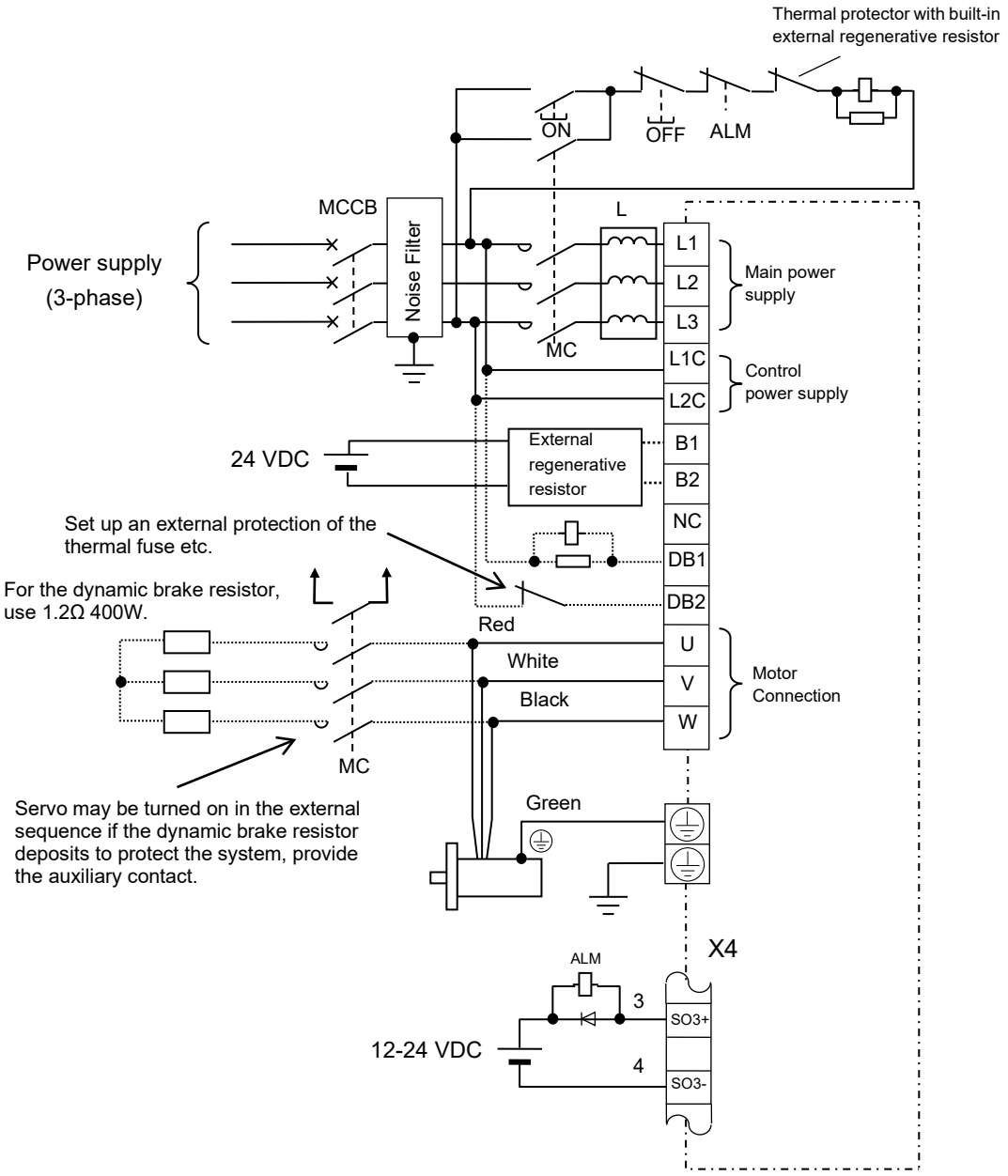
200 V Size G


Thermal protector with built-in external regenerative resistor
ON
OFF
ALM
MCCB
Noise Filter
L
Power supply (3-phase)
L1
L2
L3
Main power supply
MC
L1C
L2C
Control power supply
External regenerative resistor
B1
B2
NC
DB1
DB2
DB3
DB4
Short bar
Detach it when using an external regenerative resistor
Red
White
Black
U
V
W
Motor Connection
Green
X4
ALM
3
SO3+
12-24 VDC
4
SO3-

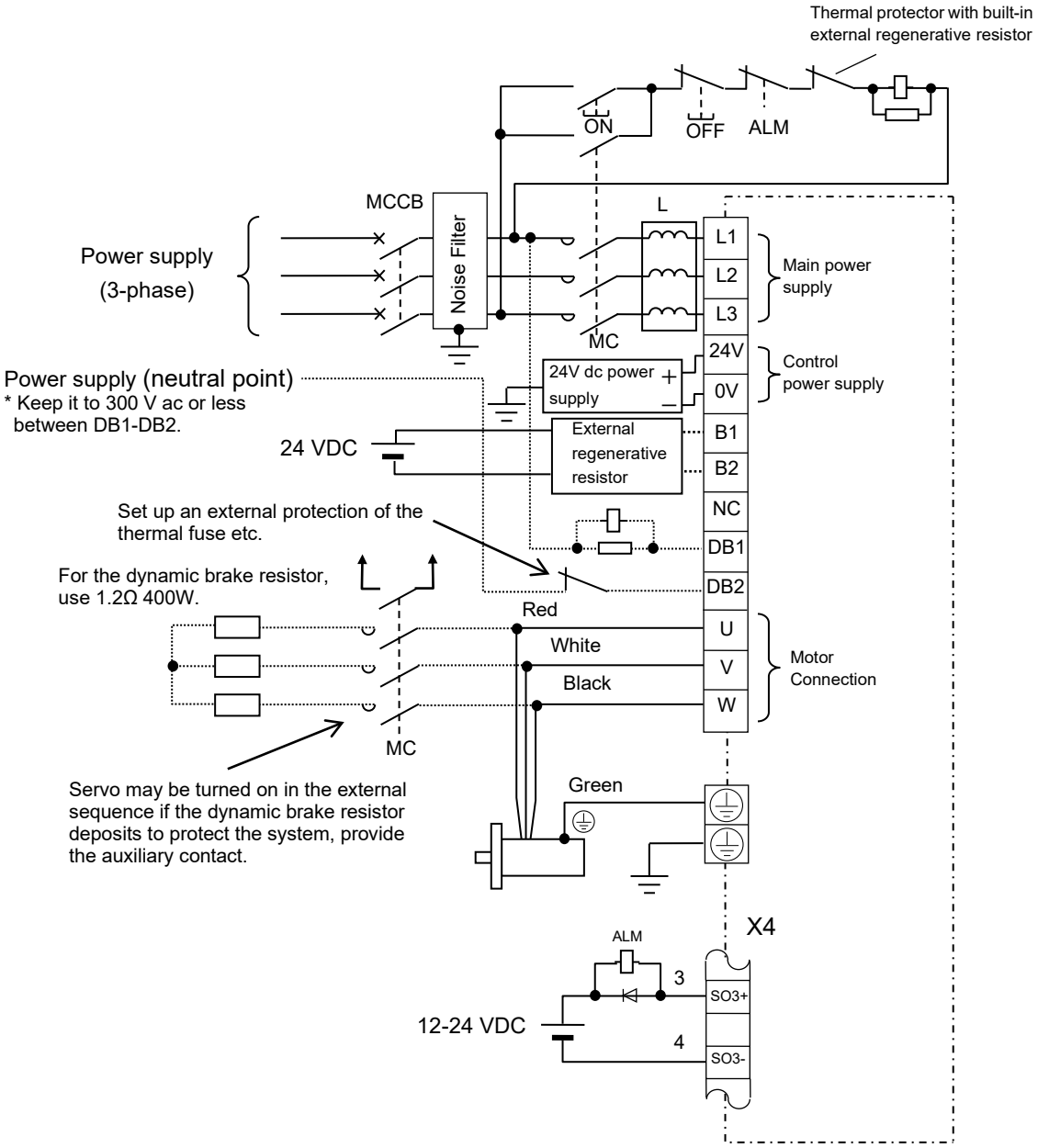
400 V Size G


Thermal protector with built-in external regenerative resistor
ON
OFF
ALM
MCCB
Noise Filter
L
MC
Power supply (3-phase)
L1
L2
L3
Main power supply
24V dc power supply
+
–
24V
0V
Control power supply
External regenerative resistor
B1
B2
NC
DB1
DB2
DB3
DB4
Short ber
Detach it when using an external regenerative resistor
Red
White
Black
U
V
W
Motor Connection
Green
X4
ALM
3
4
12-24 VDC
SO3+
SO3-

200 V Size H


Thermal protector with built-in external regenerative resistor
ON
OFF
ALM
MCCB
Noise Filter
L
Power supply
(3-phase)
L1
L2
L3
Main power supply
MC
L1C
L2C
Control power supply
24 VDC
External regenerative resistor
B1
B2
NC
DB1
DB2
Set up an external protection of the thermal fuse etc.
For the dynamic brake resistor, use 1.2Ω 400W.
Red
White
Black
U
V
W
Motor Connection
MC
Servo may be turned on in the external sequence if the dynamic brake resistor deposits to protect the system, provide the auxiliary contact.
Green
X4
ALM
3
SO3+
12-24 VDC
4
SO3-

400 V Size H


Thermal protector with built-in external regenerative resistor
ON
OFF
ALM
MCCB
Noise Filter
L
Power supply (3-phase)
L1
L2
L3
Main power supply
MC
24V
0V
Control power supply
24V dc power supply
Power supply (neutral point)
* Keep it to 300 V ac or less between DB1-DB2.
24 VDC
External regenerative resistor
B1
B2
NC
DB1
DB2
Set up an external protection of the thermal fuse etc.
For the dynamic brake resistor, use 1.2Ω 400W.
Red
White
Black
U
V
W
Motor Connection
MC
Servo may be turned on in the external sequence if the dynamic brake resistor deposits to protect the system, provide the auxiliary contact.
Green
X4
ALM
3
SO3+
12-24 VDC
4
SO3-

[1] When the servo driver uses single phase power supply for sizes A–D, connect the servo driver to the terminals L1, L3 of main power supply input. Do not connect anything to the terminal L2.

[2] Surely insert the connector into place until it clicks.

[3] Make sure to use an insulation coated crimp terminal when connecting to each terminal on the terminal block.

[4] Terminal block cover is fixed with screws. When wiring to the terminal block, unscrew these screws to uncover the cover. Tighten the cover fixing screw with the torque of 0.19 - 0.21 N・m.

[5] Apply the power supply of the voltage indicated on the nameplate.

[6] Do not reverse-connect the power input terminals (L1, L2, and L3) and the motor output terminals (U, V, and W).

[7] Do not connect the motor output terminals (U, V, and W) to ground or short out them.

[8] Because high voltage is applied to the power connectors XA, XB, XC , XD and the terminal block, never touch them on any account. It may cause electric shock.

[9] For 750 W or higher models: When the installation is protected through the circuit breaker up to 20 A capacity, the maximum power available to the circuit is 5,000 Arms at 240 V. Do not overload the system.

[10] An AC servomotor, unlike an induction motor, cannot change the rotation direction by exchanging three phases. Make sure to coincide the motor output terminals (U, V, and W) of the servo driver with the colors (pin number for cannon plugs) of the motor output cables.

[11] Surely connect the ground terminals of the motor and the servo driver and earth the ground terminal as well as that of the noise filter. In addition, earth the equipment unit. To earth them, use the ground resistance: 100 ohm or less. (In order to avoid the impact of electrolytic corrosion, do not immediately have any contact between aluminum and copper.)

[12] Attach the surge absorbing circuits for preventing noises to an electromagnetic contactor placed around the servo driver, a coil between relay contact points, and a brake winding of motor with a brake.

[13] Attach the MCCB. In case of emergency, make sure to power off outside the servo driver. To use an earth leakage circuit breaker, use that in which a high frequency wave countermeasure is taken.

[14] In order to reduce the terminal noise voltage, install a noise filter.

[15] Customer is responsible for the power supply of the brake attached to a motor.

[16] Turn ON the power after the wiring was finished.

[17] About the regenerative resistor,

- The regenerative resistor is not built into size A, B, G and H.
- The regenerative resistor is built into F frame. The regenerative resistor becomes effective when the short-circuited between the terminal B2 and B3. Use it usually under such a condition.
  (When shipping it, between the terminal B2 and B3 of size A, B, G and H is opened because the regenerative resistor is not built-in.)
  When a trip occurs due to the regenerative load protection error, externally install a regenerative resistor.
  To externally install a regenerative resistor, remove a connection cable between terminals B2 and B3 and then connect the regenerative resistor between terminals B1 and B2.
  To use an external regenerative resistor, set parameter (external regenerative resistor selection).

• As for external regenerative resistor, we recommend the resistors below:

	Input power voltage		
Size	Single phase 100 V	Single/3 phase 200 V	3 phase 400 V
A	DV0P4280	DV0P4281 (100 W or less), DV0P4283 (200 W)	-
B	DV0P4283	DV0P4283	
C	DV0P4282	DV0P4283	
D	-	DV0P4284	DV0PM20048
E		DV0P4284 x 2 in parallel or DV0P4285 x 1	DV0PM20049
F		DV0P4285 x 2 in parallel	DV0PM20049 x 2 in parallel
G		DV0P4285 x 3 in parallel	DV0PM20049 x 3 in parallel
H		DV0P4285 x 6 in parallel or DV0PM20058	DV0PM20049 x 6 in parallel or DV0PM20059

Manufacturer by Iwaki Musen Kenkyusho Co.,Ltd.

Our part number	Manufacturer part number	Specification			Built-in thermal protector operational temperature
		Resistance value [Ω]	Rated power (for reference) *		
			Free air [W]	Fan used [W] (1 m/s)	
DV0P4280	RF70M	50	10	25	140 ± 5 deg. Celsius Contact point B Open/close capacity (resistance load) 1A 125VAC, 6000 times 0. 5A 250VAC, 10000 times
DV0P4281	RF70M	100	10	25	
DV0P4282	RF180B	25	17	50	
DV0P4283	RF180B	50	17	50	
DV0P4284	RF240	30	40	100	
DV0P4285	RH450F	20	52	130	
DV0PM20048	RF240	120	35	80	
DV0PM20049	RH450F	80	65	190	
DV0PM20058	-	3.3	-	780	
DV0PM20059	-	13.33	-	1140	

* Electric power available without running the built-in thermal protector.

For safety, a temperature fuse and a thermal protector are built in.

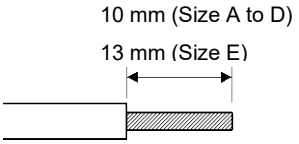
- Configure the circuit so as to turn off the power supply when the thermal protector is running.
  (Refer to the figure for connection method.)
- The built-in temperature fuse can break according to the radiation condition, the used temperature range, the power supply voltage, and the load change.
  Install a thermal fuse so that the surface temperature of the regeneration resistor does not exceed 100°C in a condition in which regeneration occurs easily (power supply voltage is high, load inertia is large, and deceleration time is short etc.) and perform an operation check.
- Attach the regenerative resistor on the incombustibles such as metal.
- Install the regenerative resistor so that people cannot directly touch it, such as the incombustible to cover it.
- Keep the temperature of places, which people can directly touch, below 70 deg. Celsius.

Method for connection to power connector

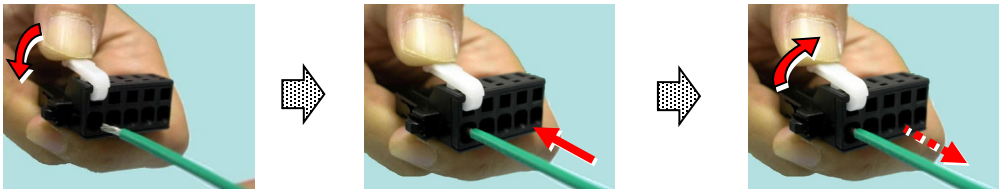
Use the following procedure for connection to connectors XA, XB, XC and XD.

<Method for connection>

1. Strip off the insulation of the wire. Please refer to the figure below for the length of strip processing.



2 Insert a wire into the connector.



[1] Press the lever attached above the upper slot with a finger to push down the spring.

[2] While pressing down the lever, insert a wire into the insertion opening (round hole) until it stops.

[3] Release the lever to connect the wire.

<Precautions>

- Strip off correct length of insulation of a wire.
- When connecting a wire to the connector, be sure to disconnect the connector from the servo driver in advance.
- Insert only 1 wire into a wire insertion opening.
- Connected wire can be removed in the same way as it is inserted.
- Be careful not to be injured when using a screwdriver.

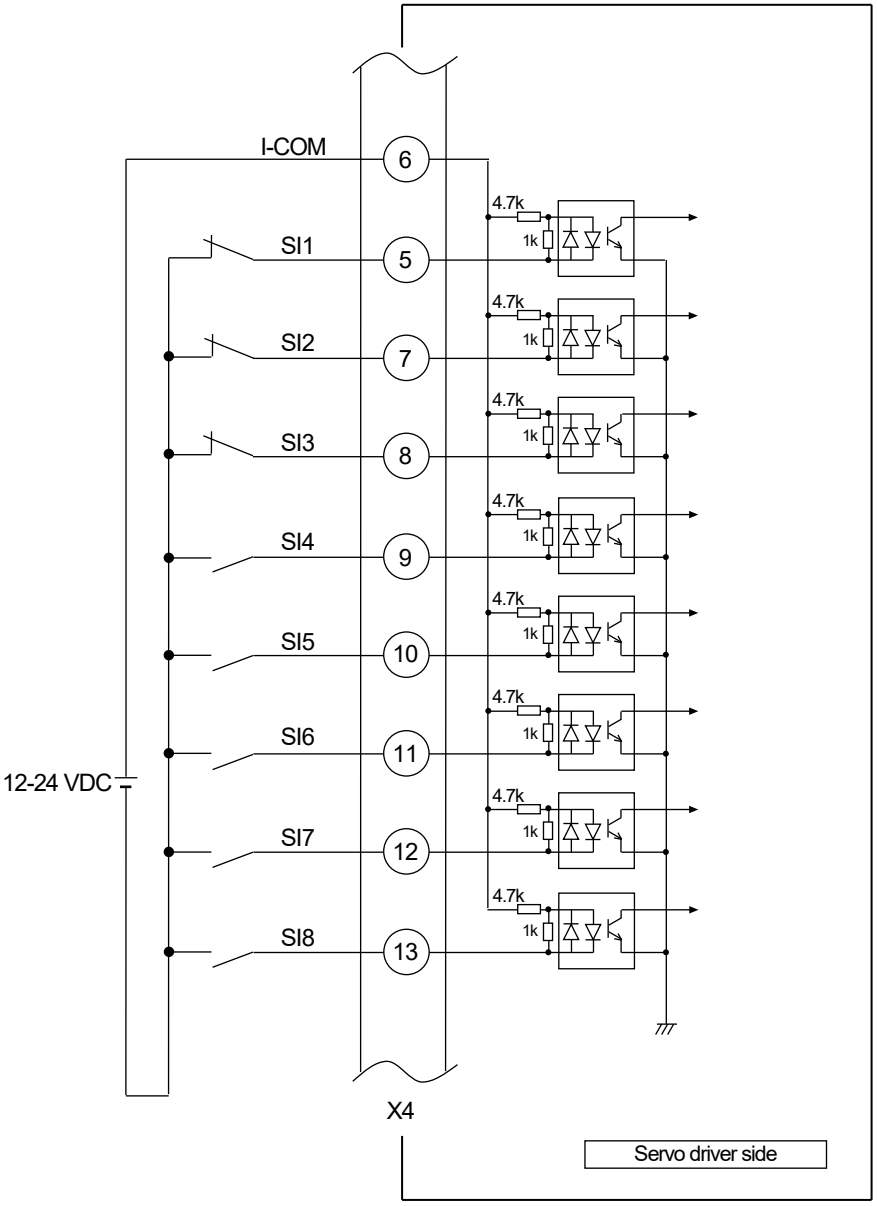
(2) Wiring to connector X4

[1] The 12–24 VDC power supply for the external control signal connected to the I-COM should be prepared by the customer.

[2] Place the servo driver and its peripheral device as nearly as possible (up to 3 m) so as to shorten the wiring.

[3] Wire the wiring as far away as possible (30 cm or more) from the power lines (L1, L2, L3, L1C, L2C, U, V, W, ⏚).
Do not put them in the same duct or bind them together.

Digital Input



The functions of the pins SI1-SI8 are assigned by parameters. For factory default settings, refer to Appendix “Specification for Each Model”.

Digital Output

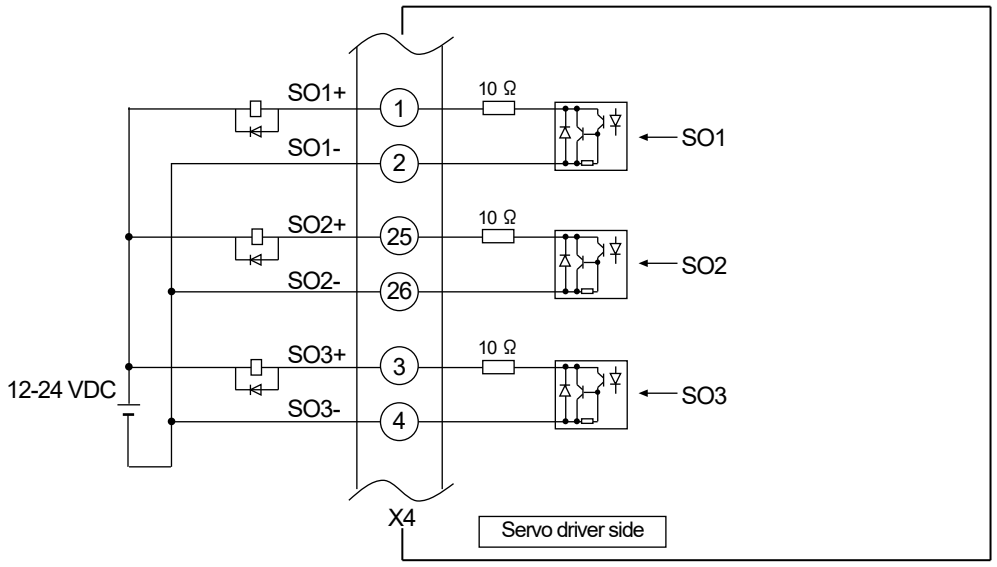
[4] Be aware of the polarity of the power supply for control signals. The polarity connection contrary to the figure shown above can damage the servo driver.

[5] To directly drive the relay with each output signal, make sure to attach a diode in parallel to the relay and in the direction as shown in the figure below. The servo driver can be damaged if the diode is not attached or the diode is attached in the reverse direction.

[6] When a logic circuit such as a gate receives each output signal, take care so that a noise does not impact on the circuit.

[7] The current flowing to each output should be set to "rated current 40 mA", maximum 50 mA "and "inrush current under 90 mA".

[8] A limiting resistor (10 ohms) is connected to the output circuit.
The output transistor is Darlington connection. When the transistor is ON, the collector-emitter voltage VCE (sat) is about 1V. Please note that normal TTL IC cannot directly connect because VIL cannot be satisfied.



The functions of the pins SO1-SO3 are assigned by parameters. For factory default settings, refer to Appendix "Specification for Each Model".

(3) Wiring to connector X6

[1] As for the encoder cable, use the batch shielded twisted wire pairs whose core is 0.18 mm^2 or more.

[2] The cable length should be up to 20 m. When the wiring is long, we recommend you to use the double wiring for the 5 V power supply in order to reduce the impact of voltage drop.

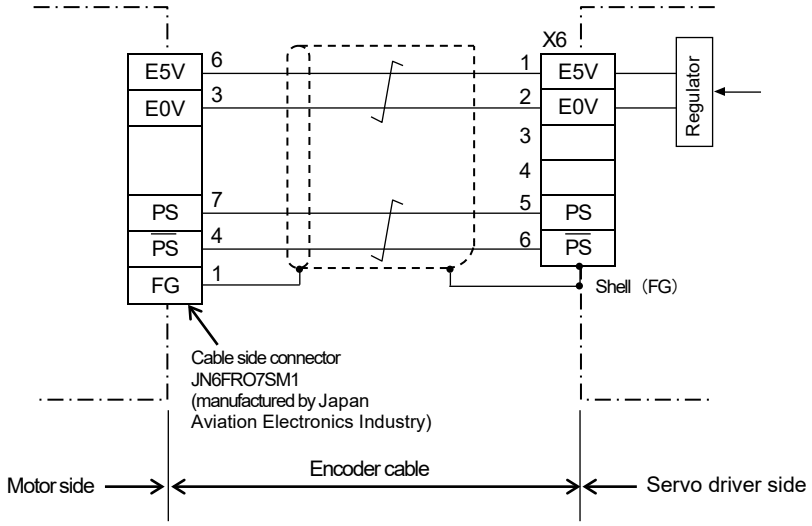
[3] Connect the coat of shielded cable at the motor side to the shield of shielded cable from the encoder. Make sure to connect the coat of shielded cable at the servo driver side to the shell (FG) of X6.

[4] Wire the wiring as far away as possible (30 cm or more) from the power lines (L1, L2, L3, L1C, L2C, U, V, W, ⏚). Do not put them in the same duct or bind them together.

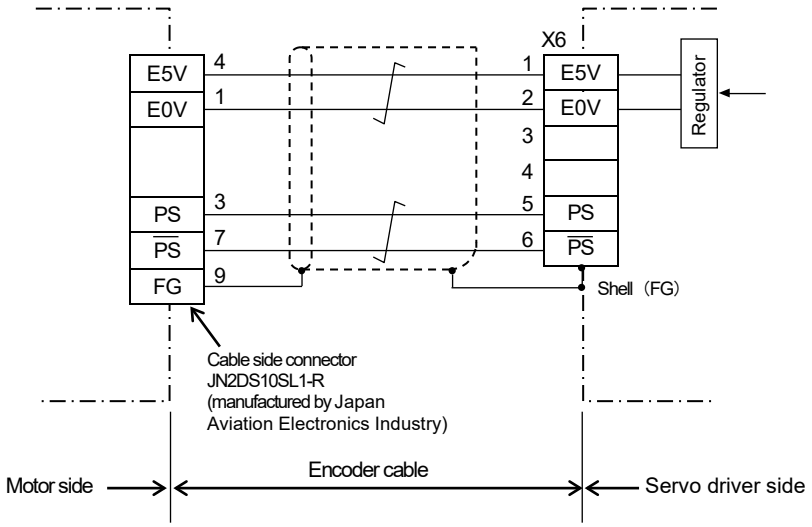
[5] Do not connect anything to the empty pins of X6.

5 wires incremental encoder

• MSME 50W - 750W

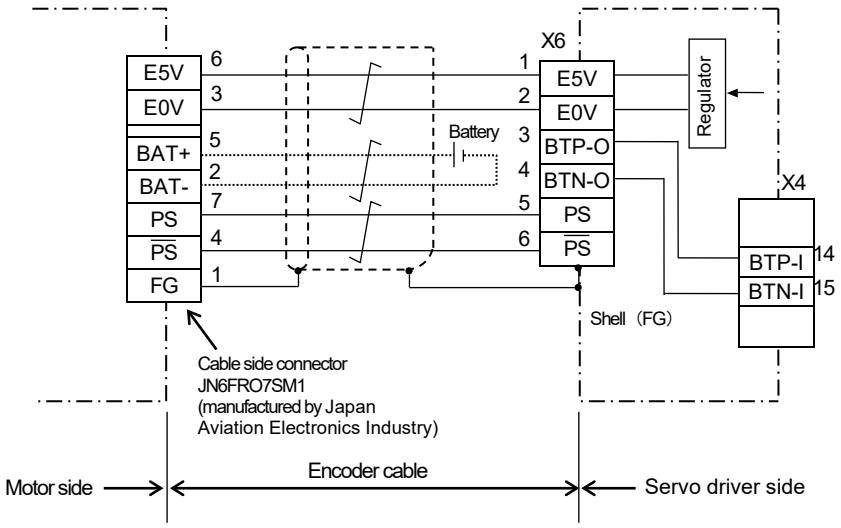


• MSME 1.0 kW – 5.0 kW
MDME 1.0 kW – 5.0 kW
MHME 1.0 kW – 5.0 kW
MGME 0.9 kW – 3.0 kW

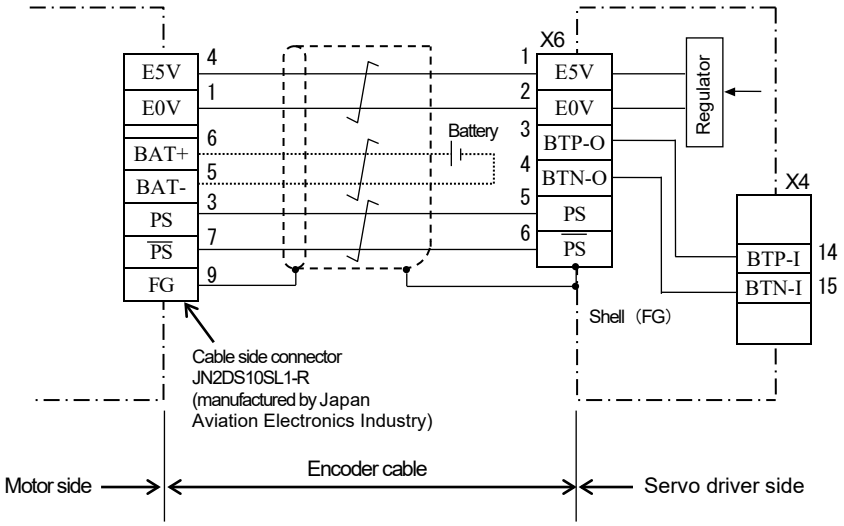


7 wires absolute encoder

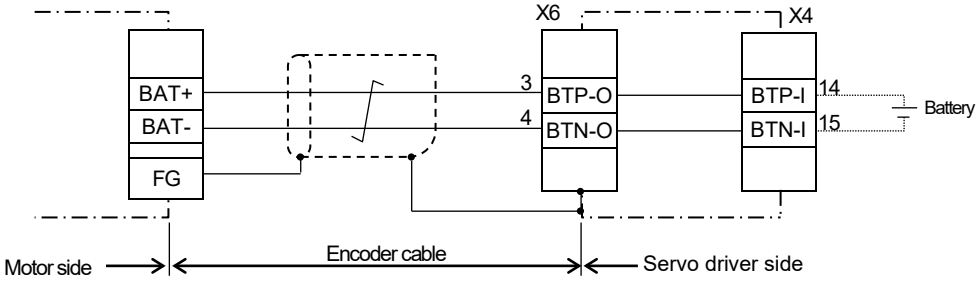
• MSME 50 W – 750 W



• MSME 1.0 kW – 5.0 kW
MDME 1.0 kW – 5.0 kW
MHME 1.0 kW – 5.0 kW
MGME 0.9 kW – 3.0 kW



Connect the absolute encoder battery directly to the BAT+ and BAT- connectors of the encoder at the motor. Or, it is also possible to connect the battery to the 14 and 15 pins of the X4, and then connect through the pins 3 and 4 of the X6.



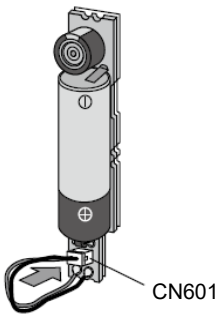
Note: If the battery is directly connected to the encoder connectors at the motor, do not connect any wire to the pins 3 and 4 of the X6.

Precautions in using a battery for absolute encoder

An error arises from the absolute encoder when a battery voltage drop occurs.
The voltage drop occurs due to the life span of a battery or voltage delay.

(1) The life span of a battery may become short depending on ambient environment.
(2) Lithium batteries have a transient minimum voltage effect (voltage delay phenomenon), in which a voltage drop may occur temporarily when discharge starts. For this reason, the batteries should be refreshed when used.

<When a battery is used for the first time>
Before using our optional battery unit DV0P2990, connect the connector with lead wires to the battery as shown in the right figure and leave it for about 5 minutes. And then disconnect the connector from the CN601, and install it to the servo driver.
If using another battery, we recommend that you also refresh the battery. For refreshing a battery, consult with the manufacturer of the battery.



<After installing battery>
We recommend that control power be turned on/off once a day.

Other precautions

- If used incorrectly, batteries may cause troubles such as corrosion due to leakage and hazards such as explosion. So, observe the following rules:
  [1] Insert a battery correctly without confusing + and - terminals.
  [2] If a battery used for a long time or no longer used is left inside equipment, a trouble such as leakage may occur. Replace such a battery as soon as possible. (As a standard, we recommend replacing batteries every 2 years.)
    • The battery electrolyte is highly corrosive. It not only corrodes surrounding parts, but it also causes hazards such as a short-circuit due to its conductivity. Replace batteries periodically.
  [3] Do not disassemble batteries or throw them into fire.
    • Do not disassemble the battery because it is very dangerous if a splash of the contents comes into an eye. Also, do not throw the battery into fire or heat it because it may burst, causing hazards.
  [4] Do not short-circuit the battery or remove its tube.
    • If the battery + and - terminals are connected together with a conductive material such as a metal, a large current flows, not only weakening the battery, but also generating excessive heat, resulting in a burst to cause hazards.
  [5] Never attempt to charge the battery because it is not rechargeable.
- Disposal of old batteries after replacement may be restricted by local governments. Dispose of batteries following such a restriction.
- Air transportation
  Application for approval of hazardous material air transportation is required (for both passenger and cargo airplanes). (UN packing is required.)
  When you ask for air transportation, you are requested to submit necessary documents (parameter sheets and SDS etc.). In this case, make a request to us through a dealer you purchased from.
- UN packing
  Consult with your transport company.

(4) Wiring to connector X5 (Not supported)

[1] As for the external scale cable, use the batch shielded twisted wire pairs whose core is 0.18 mm^2 or more.

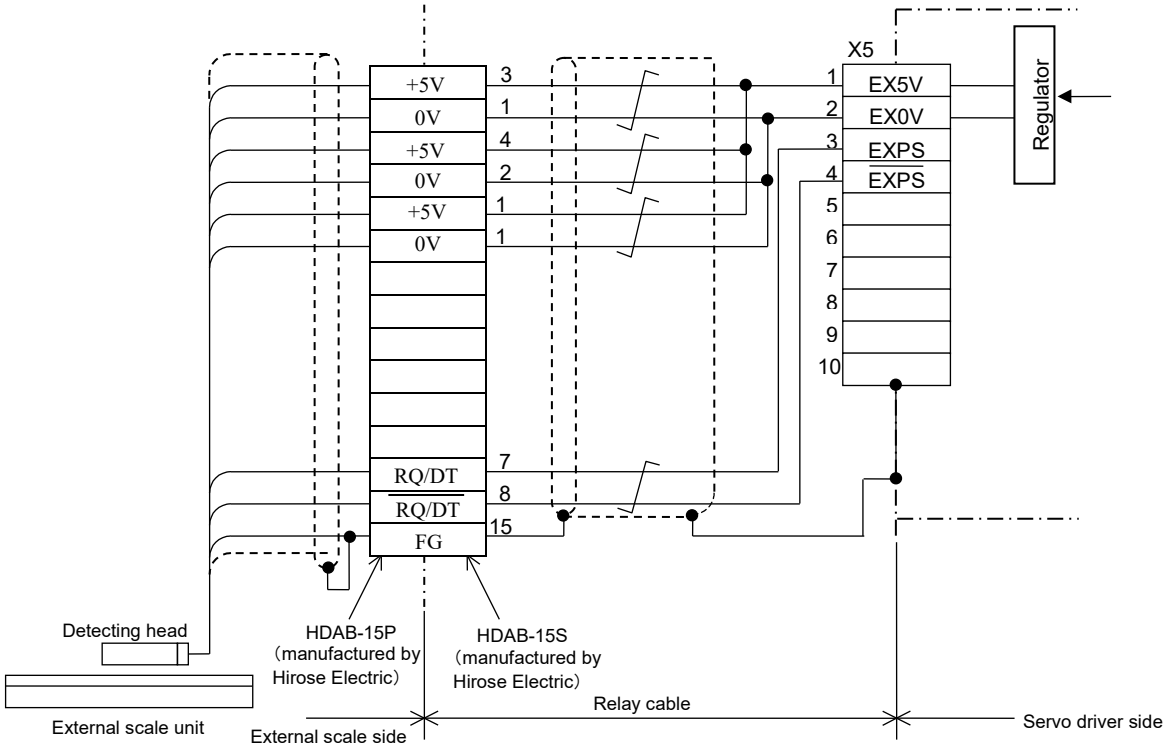
[2] The cable length should be up to 20 m. When the wiring is long, we recommend you to use the double wiring for the 5 V power supply in order to reduce the impact of voltage drop.

[3] Connect the coat of shielded cable at the motor side to the shield of shielded cable from the external scale. Make sure to connect the coat of shielded cable at the servo driver side to the shell (FG) of X5.

[4] Wire the wiring as far away as possible (30 cm or more) from the power lines (L1, L2, L3, L1C, L2C, U, V, W, ⏚). Do not put them in the same duct or bind them together.

[5] Do not connect anything to the empty pins of X5.

[6] X5 is capable to supply up to 5.2 V ± 5% 300mA power supply. When using an external scale at more consumption current than this, customer is responsible for the power supply. Some external scales may take longer time in initialization after turning on the power. Design the power supply so as to meet the running timing after power-on which is described in “Basic function specifications.”



5) Wiring to connector X2A , X2B

[1] Use straight type of 8core 4pairs shielded twisted pair (STP) compatible with category 5e of TIA/EIA-568 or higher specifications.

When installing connector plug on both ends of shielded cable, positively connect the shield to the metallic plug shell. If connection is not proper, EMC characteristic could degrade.

For colors of wire and matching connector pins, refer to TIA/EIA568B (see figure below).

Connect a cable before supplying the power to the driver. Do not pull or insert a cable after supplying the power to the driver.

PIN 1, 2, 3 and 6 are signal lines. The unused PIN 4, 5, 7 and 8 also need to be connected.

[2] Length of communication cable

Between 2 nodes: max. 100 m

Because specifications such as flexural characteristic, temperature range and insulation material differ from manufacturer to manufacturer, select the cable best suitable for your application.

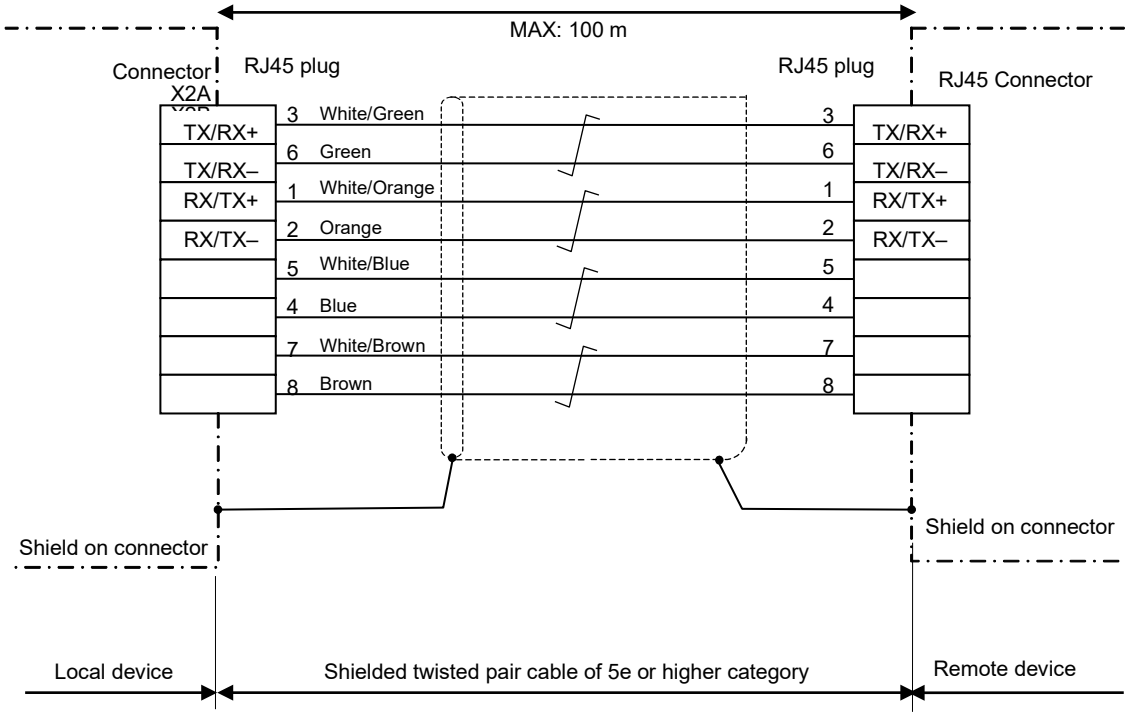
Select the cable for movable application according to your operating condition.

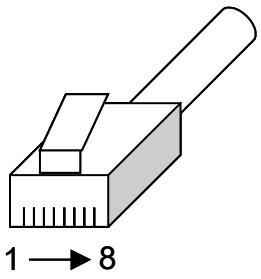
<Communication cable used in our evaluation>

Manufacturer: Sanwa Supply Inc.

Part No.: KB-STP-*K, Category: 5e, STP

Connection to X2A / X2B





Pins on RJ45 plug

9. Compliance with EU Directive/UL Standard

9-1 EU Directive

EU directive is applied to all electronic products that are exported to EU, have the inherent functions, and are directly sold to the consuming public. These products are obliged to be compliant with the unified EU safety standard and paste the CE marking indicating the compliance to the products.
Our products, in order to make it easy for the embedded equipment and devices to be compliant with EU directive, provide the compliance with the standards associated with low voltage directive.

9-1-1 Compliance with EMC Directive

Our servo system determines the model (conditions) such as the installed distance and the wiring of the servo driver and the servo motor and makes the model compliant with the standards associated with EMC directive. When equipment and devices are embedded in practice, wiring and grounding conditions, etc. may be not the same as the model. Thus, it is necessary to measure how the final equipment and devices where the servo driver and the servo motor are embedded are compliant (especially unnecessary radiation noise, noise terminal voltage) with EMC directive.

9-1-2 Conforming Standards

		Servo driver
EU/UK Standards	EMC	EN55011 EN61000-6-2 EN61800-3
	Low voltage	EN61800-5-1
	Machinery (Functional Safety)	ISO13849-1 (Cat. 3, PL d) EN61508 (SIL 2) EN62061 (SIL CL 2) EN61800-5-2 IEC61326-3-1
UL standard		UL508C (File No. E164620)
CSA standard		C22. 2 No. 14
KC Mark		KN11 , KN61000-4-2,34,5,6,8,11

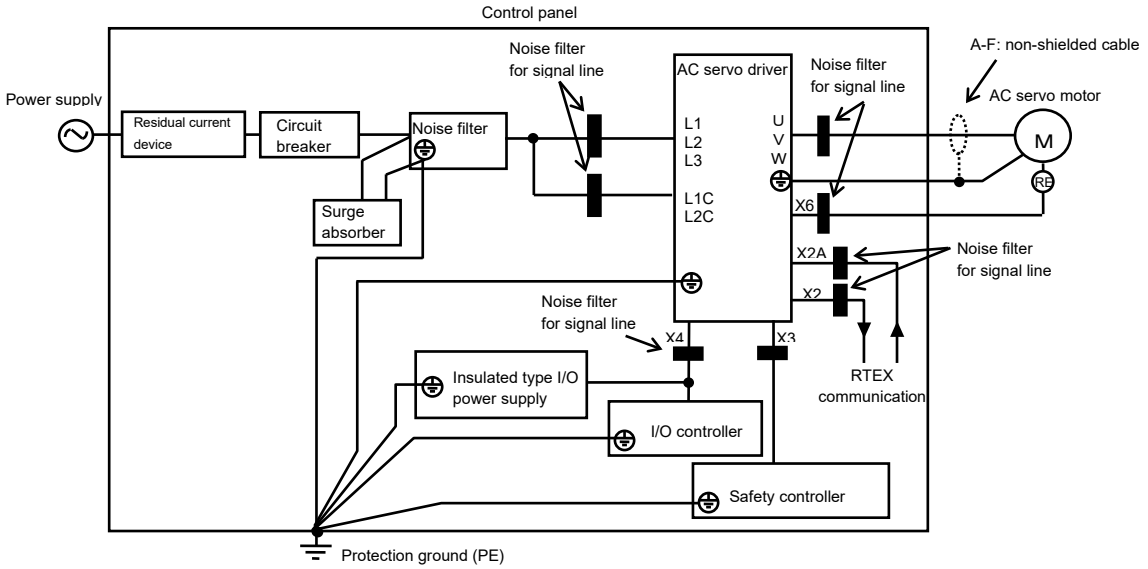
IEC : International Electrotechnical Commission
EN : Europaischen Norman
EMC : Electromagnetic Compatibility
UL : Under writers Laboratoris
CSA : Canadian Standards Association
ISO : International Organization for Standardization

9-2 Peripheral Device Configuration

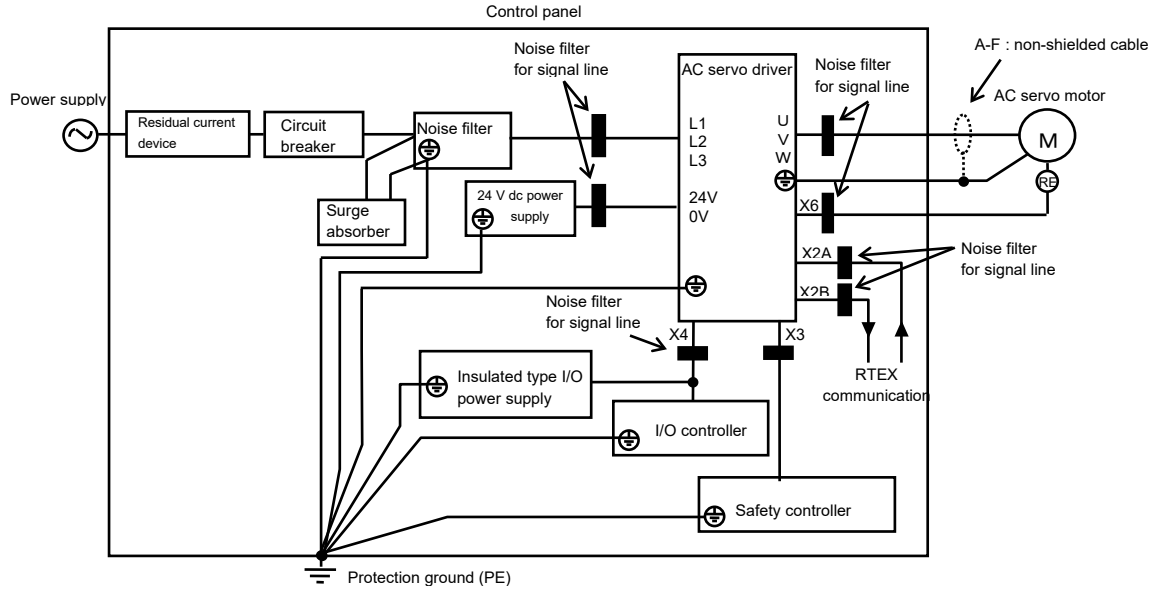
9-2-1 Installation Environment

Use the servo driver under the environment of pollution level 2 or 1 defined in IEC60664-1.
(Example: Installed in the IP54 control panel.)

- 100 V/200 V system



- 400 V system



9-2-2 Power Supply

100 V system: Single phase 100 V – 120 V $^{+10\%}_{-15\%}$ 50/60 Hz

200 V system (Sizes A–D): Single/ 3 phase 200 V – 240 V $^{+10\%}_{-15\%}$ 50/60 Hz

200 V system (Sizes E, F): 3 phase 200 V – 230 V $^{+10\%}_{-15\%}$ 50/60 Hz

400 V system (Sizes D–F): 3 phase 380 V – 480 V $^{+10\%}_{-15\%}$ 50/60 Hz
Control power supply 24 V dc +/- 15%

(1) Use it under the environment of overvoltage category II defined in IEC60664-1.
(2) As for the interface power supply, use the CE marking conforming product or the 12–24 VDC power supply of insulation type compliant with EN standard (EN60950).

9-2-3 Circuit Breaker

Make sure to connect a circuit breaker compliant with IEC standard and UL certification (marked with LISTED, Ⓤ) between the power supply and the noise filter.

9-2-4 Noise Filter

To install one noise filter as a whole in the power unit when multiple servo drivers are used, consult the noise filter manufacturer.

9-2-5 Surge Absorber

Install the surge absorber in the primary side of the noise filter.
Please!
To carry out a pressure test of equipment and devices, make sure to detach the surge absorber.
Otherwise, the surge absorber can be damaged.

9-2-6 Noise Filter for Signal Line

Install the noise filters for signal lines in all cables (power supply, motor, encoder, and interface cables).
For size D, install three noise filters in the power supply cable.

9-2-7 Grounding

(1) In order to avoid an electric shock, make sure to connect a protection Earth terminal (⏚) of the servo driver and the protection ground (PE) of the control panel.
(2) Do not tighten the connection to the Earth terminal (⏚) along with other parts. The servo driver has two ground terminals.

9-3 List of Peripheral Devices Applicable to Servo Driver

Servo Amp.	Motor Used	Voltage Spec.	Rated Output	Power Capacity (Rated Current)	Circuit Breaker (Rated Current)	Noise Filter	Serge Absorber	Noise Filter for Signals	Electromagnetic Contactor (Rated Current/ Released Heat Current)	Main Circuit Cable Dia.	Control Power Cable Dia.	Terminal Block Crimp Terminal
MADH	MSME	Single phase 100V	50W 100W	Approx. 0.4kVA	10A	DV0P4170	DV0P4190	DV0P1460	20A		0.75mm² AWG18	
	MSME	Single/ 3 phase 200V	50W - 200W	Approx. 0.5kVA		DV0P4170 (for single phase) DV0PM 20042 (for3phase)	DV0P4190 (for single phase) DV0P1450 (for3phase)					
MBDH	MSME	Single phase 100V	200W	Approx. 0.5kVA		DV0P4170	DV0P4190			0.75- 2.0mm² AWG14 -18		
	MSME	Single/ 3 phase 200V	400W	Approx. 0.9kVA		DV0P4170 (for single phase) DV0PM 20042 (for3phase)	DV0P4190 (for single phase) DV0P1450 (for3phase)					Connec -tion to the dedicated connector
MCDH	MSME	Single phase 100V	400W	Approx. 0.9kVA		DV0PM 20042	DV0P4190					
	MSME	Single/ 3 phase 200V	750W	Approx. 1.3kVA	15A		DV0P4190 (for single phase) DV0P1450 (for3phase)					
MDDH	MDME	Single/ 3 phase 200V	1.0kW	Approx. 1.8kVA		DV0P4220			30A	2.0mm² AWG14		
	MGME		900W		20A							
	MSME		1.0kW									
	MDME		1.5kW	Approx. 2.3kVA								
	MSME											
	MFME											
	MDME	3 phase 400V	400W	Approx. 0.9kVA	10A	FN258L-1 6-07	DV0PM 20050		20A	2.0mm² AWG14	0.5mm² AWG20	
	MDME		600W	Approx. 1.2kVA								
	MSME		750W	Approx. 1.6kVA								
	MGME		900W	Approx. 1.8kVA								
	MDME		1.0kW	Approx. 1.8kVA								
	MSME											
	MDME		1.5kW	Approx. 2.3kVA								
	MSME											
	MFME											
MEDH	MDME	3 phase 200V	2.0kW	Approx. 3.3kVA	30A	DV0PM 20043	DV0P1450	DV0P1460 RJ8035	60A	2.0mm² AWG14	0.75mm² AWG18	
	MSME											
	MFME		2.5kW	Approx. 3.8kVA								
	MDME	3 phase 400V	2.0kW	Approx. 3.3kVA	15A	FN258L-1 6-07	DV0PM 20050	DV0P1460	30A	2.0mm² AWG14	0.5mm² AWG20	
	MSME											
	MFME		2.5kW	Approx. 3.8kVA								

Servo Amp.	Motor Used	Voltage Spec.	Rated Output	Power Capacity (Rated Current)	Circuit Breaker (Rated Current)	Noise Filter	Serge Absorber	Noise Filter for Signals	Electromagnetic Contactor (Rated Current/ Released Heat Current)	Main Circuit Cable Dia.	Control Power Cable Dia.	Terminal Block Crimp Terminal
MFDH	MGME	3 phase 200V	2.0kW	Approx. 3.8kVA	50A	DV0P3410	DV0P1450	DV0P1460 RJ8035	100A	3.5mm² AWG12	0.75mm² AWG18	Terminal Block M5
	MDME		3.0kW	Approx. 4.5kVA								
	MHME											
	MSME											
	MGME											
	MDME		4.0kW	Approx. 6kVA								
	MHME											
	MSME											
	MGME		4.5kW	Approx. 7.5kVA								
	MFME											
	MDME		5.0kW									
	MHME											
	MSME											
	MGME	3 phase 400V	2.0kW	Approx. 3.8kVA	30A	FN258L-30-07	DV0PM 20050	DV0P1460	60A			
	MDME		3.0kW	Approx. 4.5kVA								
	MHME											
	MSME											
	MGME											
	MDME		4.0kW	Approx. 6kVA								
	MHME											
	MSME											
	MGME		4.5kW	Approx. 7.5kVA								
	MFME											
	MDME		5.0kW									
	MHME											
	MSME											
MGDH	MGME	3 phase 200V	6.0kW	Approx. 9.0kVA	60A	FS5559-60-34	DV0P1450	DV0P1460 RJ8095 T400-61D	100A	5.3mm2 AWG10		Terminal Block M5
	MDME		7.5kW	Approx. 11kVA								
	MHME											
	MGME	3 phase 400V	6.0kW	Approx. 9.0kVA	30A	FN258-42-07	DV0PM 20050		60A			
	MDME		7.5kW	Approx. 11kVA								
	MHME											
MHDH	MDME	3 phase 200V	11.0kW	Approx. 17kVA	100A	FS5559-80-34	DV0P1450		150A	13.3mm2 AWG6		Terminal Block M6
	MDME		15.0kW	Approx. 22kVA	125A							
	MDME	3 phase 400V	11.0kW	Approx. 17kVA	50A	FN258-42-07	DV0PM 20050		100A			
	MDME		15.0kW	Approx. 22kVA	60A							

- Select the specification common to single/3 phase 200 V according to the power supply.
- To become compliant with EU directive, make sure to connect a circuit breaker compliant with IEC standard and UL certification (marked with LISTED) between the power supply and the noise filter.

Please!

- Select a circuit breaker and a noise filter with the capacity comparable to the power capacity (by taking into account the load condition).
- Terminal block and earth terminal
  For wiring, use the copper conductor cable of the temperature rating 75 deg. Celsius or more.

- Tightening torque view (Terminal block and terminal cover)

Driver		Terminal screw		Terminal cover fixing screw	
Frame	Terminal Symbol	Nominal designation	Tightening torque (Nm)	Nominal designation	Tightening torque (Nm)
F 200 V	L1,L2,L3,L1C,L2C,B1,B2,B3,NC,U,V,W	M5	1.0-1.7	M3	0.19-0.21
F 400 V	24V,0V	M3	0.4-0.6		
	L1,L2,L3,B1,B2,B3,NC,U,V,W	M4	0.7-1.0		
G	L1C,L2C,24V,0V,DB1,DB2,DB3,DB4,NC	M5	1.0～1.7		
	L1,L2,L3,B1,B2,NC,U,V,W	M5	2.0～2.4	M3	0.3～0.5
H	L1C,L2C,24V,0V,DB1,DB2	M4	0.7～1.0	M5	2.0～2.5
	L1,L2,L3,B1,B2,NC,U,V,W	M6	2.2～2.5		

- Tightening torque view (Earth terminal and I/O connector X4)

Driver	Earth terminal		I/O connector X4	
Frame	Nominal designation	Tightening torque (Nm)	Nominal designation	Tightening torque (Nm)
A-E	M4	0.7-0.8	M2.6	0.2±0.05
F,G	M5	1.4-1.6		
H	M6	2.4~2.6		

- The terminal block can be damaged if the screw tightening torque exceeds the maximum value.
- For the earth wire dia. and dynamic brake resister wire dia., use more than the motor wire diameter.
- For Sizes A–E, use the dedicated connector which came with the product.
  In this case, the stripped cable length should be 8–9 mm.

	Optional Part Number	Part Number of Manufacturer	Manufacturer
Surge absorber	DV0P1450	R･A･V-781BXZ-4	Okaya Electric Industries
	DV0P4190	R･A･V-781BWZ-4	
	DV0PM20050	R･A･V-801BXZ-4	
Noise filter for signal line	DV0P1460	ZCAT3035-1330	TDK
	—	RJ8035	Konno Kogyousho
	—	RJ8095	
	—	T400-61D	MICROMETALS
Noise filter	DV0P4170	SUP-EK5-ER-6	Okaya Electric Industries
	DV0P4180	3SUP-HQ10-ER-6	
	DV0P4220	3SUP-HU30-ER-6	
	DV0P3410	3SUP-HL50-ER-6B	
	DV0PM20042	3SUP-HU10-ER-6	
	DV0PM20043	3SUP-HU50-ER-6	
	—	FN258L-16-07	Schaffner
	—	FN258L-30-07	

9-4 Compliance with UL Standard

Certified by the UL508C (file No. E164620) standard by observing the installation conditions [1], [2] below.

[1] Use the servo driver under the environment of pollution level 2 or 1 defined in IEC60664-1. (Example: Installed in the IP54 control panel.)

[2] Make sure to connect a circuit breaker or fuse compliant with UL certification (marked with LISTED, Ⓤ$_{L}$) between the power supply and the noise filter.

For information about rated current of the circuit breaker/ fuse, refer to “9-3 List of Peripheral Devices Applicable to Servo Driver”.

For wiring, use the copper conductor cable of the temperature rating 60 deg. Celsius or more.

The terminal block can be damaged if the screw tightening torque exceeds the maximum value (M4: 1.2 N•m, M5: 2.0 N•m.).

[3] Overload protection level

The overload protection function of the servo driver works when the effective current will be 115% or more of the rated current based on the time property. Check that effective current of the servo driver does not exceed the rated current by monitoring the load factor using PANATERM or by other methods. Set up the maximum instantaneous allowable current at the “first torque limit” and “second torque limit”.

[4] The servo driver will comply with UL in the power supply environment of 5,000 Arms or lower.

[5] Motor over-temperature protection is not provided. Motor over-load-temperature protection shall be provided at the final installation upon required by the NEC (National Electric Code).

9-5 Compliance with KC mark

Conformity of Korea Certification mark is registered by suiting EMC directive.

Registration No. KCC-REM-FAN-M-D

10. Compliance with SEMI F47 Voltage Sag Immunity Standard

- This function corresponds to the F47 voltage sag immunity standard in the SEMI standard during no/ light load condition.
- Useful when used in the semiconductor manufacturing equipment.

Warning:

[1] Not applicable to the servo driver which has a single phase 100 V specification and a 24 VDC specification for control power input.

[2] Make sure to evaluate and confirm the compliance with F47 voltage sag immunity standard with an actual device.

⚠ Safety Precautions

11. Safety Precautions

The following explanations are for things that must be observed in order to prevent harm to people and damage to property.

■The degree of the injury or damage caused when using the product improperly is categorized and an explanation is provided.

⚠ DANGER	Indicates “actions carrying a significant risk of death or serious injury.”
⚠ CAUTION	Indicates “actions carrying the risk of the occurrence of minor injury or property damage.”

■The actions to be observed are explained with the following symbols.

	Indicates actions that must not be performed.
	Indicates actions that must be performed without fail.

⚠ DANGER

(1) Use the product in an environment of pollution degree 2 or 1 (a place where the product will not come in contact with foreign matter such as dust, metal particles and oil mist, or liquids such as water, oil and polishing liquid). Avoid using the product near flammable objects, in an atmosphere of corrosive gas (such as H2S, SO2, NO2, Cl2) or storing or using the product in an atmosphere of flammable gas.

(2) Do not place inflammable material near a motor, a driver, or a regenerative resistance.

(3) Do not drive the motor with external torque. Motor generates electricity by external torque.
Dynamic brake circuit will be damaged and it is possible that short-circuit current cause smoke or combustion.

(4) Do not damage the cable nor place too much stress or heavy object on the cable. Do not pinch the cable.

(5) Do not operate the product while the cable is dipped in oil or water.

(6) Do not install the equipment near a heating object such as a heater or a large wire-wound resistor.
(Install a thermal shield, etc. to avoid the influences of heating object.)

(7) Do not connect the motor to the commercial power source directly.

(8) Do not use the equipment under conditions subject to strong vibrations or an impact shock. Please attach the anti-vibration equipment to servo driver mounting surface if you install the servo driver in the vicinity of the vibration source.

(9) Be sure not to touch the rotating part of the motor during operation.

(10) Do not touch the keyway of the output shaft of the motor with bare hands.

(11) Be sure not to insert your hand into the driver.

(12) Do not touch the motor, the heat sink of the driver nor the surrounding equipment since they will be hot.

(13) Do not perform wiring nor operate the product with wet hand.

(14) Be sure that the wiring task is performed by electrical engineer.

(15) There is no protective device attached to the motor other than the specified ones. Please protect them with an overcurrent protective device, a ground-fault circuit interrupter, an over temperature preventing device, an emergency stop device, and the like.

⚠ Safety Precautions

⚠ DANGER

(16) When starting operation of the driver after an earthquake, please make sure that there is no abnormality as to the installation condition of the driver and the motor and the safety of the machine before starting operation.

(17) After turning off the power, the inside circuit remains charged at a high voltage for a while. When moving, wiring or inspection the equipment, completely shut off the power supply input outside the driver and leave for 15 minutes or longer before working.

(18) To prevent causing fire or accident resulting in injury or death due to improper installation or mounting at the occurrence of earthquake, please install or mount the device securely.

(19) Install an external emergency shutoff circuit to stop operation and interrupt power immediately upon emergency. Emission of smoke or dust may occur due to a fault of a motor or a driver used in combination. For example, if the system is energized with the regenerative control power transistor shorted by failure,overheating of a regenerative resistor installed outside the driver may occur and it may emit smoke and dust. If a regenerative resistor is connected outside a driver, provide a means of detecting overheating such as a thermal protector to shut off power upon detecting abnormal heating.

(20) Install the motor, the driver, and the surrounding devices on nonflammables such as metal.

(21) Perform wiring correctly and securely. Insecure and incorrect wiring may be the cause of abnormal motor operation and its damage by fire.
Also, please make sure that no electrical conducting material such as a scrap of electric wire get inside the driver at the time of performing installation and wiring task.

(22) Connect the cables securely, and firmly insulate the current-carrying part with insulating material.

(23) When using a bundling wire is inserted into the metal ducts, because burning for wire allowable current is decreased by the temperature rise.

(24) Be sure to install a fuseless breaker in a power supply. Be sure to connect grounding terminals and grounding wires. To prevent an electric shock and malfunction, grounding resistance at 100 Ω or lower is recommended.

(25) Tighten the screws on the terminal block for connection securely at appropriate torque shown in the specifications of the driver.

(26) When building a system by using the safety feature, design it by fully understanding and being compliant with the related safety standards and items described in our operation manual or technical reference.

⚠ CAUTION

(27) When transferring the product, do not hold the cable or the shaft of the motor.

(28) Do not adjust or modify the gain of the driver extremely, nor let the operation or movement of the machine be unstable.

(29) After recovering from power failure, do not get close to the machine because there is a possibility that the machine restarts suddenly.
Setting must be made to the machine so that safety for the worker is ensured when the machine restarted suddenly.

(30) When the equipment is energized, keep away from the motor and mechanism driven by the motor in case of malfunction.

(31) Do not apply strong shock to the shaft of the motor.

(32) Be sure not to start or stop the motor with the electromagnetic contactor installed on the main power source side.

(33) Do not switch on or off the main power supply of the driver frequently.

(34) Since the brake built in the motor is used for maintenance, do not use it as a stopping device (braking) to ensure the safety of the machine.

(35) Be careful not to drop or to topple over the product when transferring or performing installation task.

⚠ Safety Precautions

⚠ CAUTION

(36) Do not clime on the motor or place heavy object on the motor.

(37) Do not cover the louver on the driver nor insert foreign matter.

(38) Do not use the product in an area exposed to direct sunlight. And when storing the product, avoid direct sunlight and keep the temperature and the humidity within the range specified for when the product is in use.

(39) Never overhaul or modify the motor.
Overhauling will be performed at our company or at the retailers approved by our company

(40) Do not start/stop the a product by the turning on/off the servo ON command (SRV-ON).
Otherwise the dynamic brake circuit built in the servo driver may get dameged.

(41) Use the motor and the driver in the combination specified by our company. Please confirm the performance and the safety at customer when the motor is used in combination with another driver.

(42) Due to the trouble with the motor or the driver combined, the motor may be damaged by fire, or smoking or dusting might occur. Please consider these possibilities when they are to be used in a clean room or the like.

(43) Perform proper installation which is in proportion to the output and the weight of the main body.

(44) Keep the ambient temperature and humidity of the installed motor within the range of allowable temperature and humidity.

(45) Observe the specified installation method and the orientation of the product.

(46) Keep a space as specified between the driver and the inner surface of the control panel, or between the driver and the other devices when installing the product.

(47) Use the eyebolt attached to motor only for transferring the motor, but not for transferring the equipment. And do not use them with the speed reducer or heat sink attached to the motor.

(48) Install a relay used to break the circuit at the time of emergency stop in series with the relay used to control the brake.

(49) Fix the motor at the time of test run, and confirm its movement after isolating it from the mechanical system, and then mount it on the machine.

(50) Verify that an input power supply voltage satisfies the driver specifications before turning on the power and start operation.
An input voltage higher than rated may cause ignition and smoking in the driver, which may cause malfunction or burning of a motor in some cases.

(51) When an alarm status occurs, remove a cause of the problem before restarting.
Careless restarting without removing a cause of problem may cause malfunction or burning of a motor.

(52) The brake built in the motor may not be maintained due to its life span, the mechanical structure, and so on. Please install a stopping device to ensure the safety on the machine side.

(53) The driver generates heat by operating a motor. A driver used in a sealed box may cause an extreme rise of temperature.
Consider cooling so that an ambient temperature around the driver satisfies an operating range.

(54) Maintenance should be performed by the specialist.

(55) If the product is not to be used for a long period of time, be sure to turn off the power.

(56) Allow approx. 10 minutes pause when the dynamic brake is activated during high-speed running.
Resistor is damaged and the dynamic brake might not work when using it under more critical operating condition.

(57) Fix the cable so that stress is not applied to the connection parts such as the connector and terminal block.

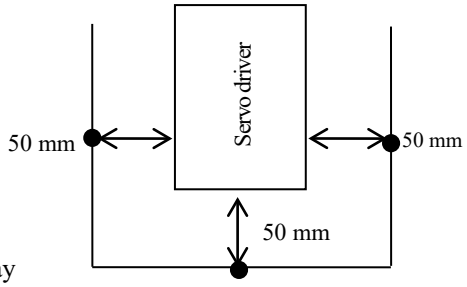
- The capacity of the capacitor for the power rectifying circuit decreases over time. It is recommended to replace it every five years or so, in order to prevent secondary accidents due to malfunction. Replacement should be performed in our factory or our designated factory.
- Before using the product, be sure to read the “Safety Instructions” included with the product.

⚠ Safety Precautions

Temperature around the servo driver

The life span of the servo driver significantly depends on ambient temperature.
Make sure that temperature within 50 mm from the servo driver does not exceed the working temperature range.

If it is impossible to measure temperature in a place 50 mm away from the servo driver, perform measurement at the mid point in the clearance between the obstacle and the servo driver.



Working temperature range: 0 - 55°C

12. Life span

(This is not a guaranteed item.)

12-1 Expected life span of the servo driver

When the servo driver is used continuously under the following conditions, the expected life span is 28,000 hours.
Definition of life ... The time from when the product is shipped until the capacity of the electrolytic capacitor is reduced by 20%

Conditions	Input power supply	:	Single-phase 100 VAC, 50/60 Hz, Three-phase 200 VAC, 50/60 Hz,
	Ambient temperature	:	55 ºC
	Above sea level	:	100 m or less
	Output torque	:	Constant rated torque
	Rotation speed	:	Constant rated rotation speed

Life span changes significantly depending on working conditions.

12-2 Standard life span

12-1-1 Rush current protection circuit

The expected life span of the rush current protection circuit is approx. 20,000 times. However, it varies depending on environmental conditions and usage.

12-1-2 Cooling fan

The standard replacement period of the cooling fan is approx. 20,000 hours. However, it varies depending on environmental conditions and usage.

13. Warranty

13-1 Warranty period

The manufacturer warrants the quality of its product for one year after purchasing by customer or one and a half year after the month of production at our factory. The warranty, however, is not applicable to the following, even within the period of warranty:

(1) Failures due to wrong use, inappropriate repair or modifications.
(2) Failures due to falling after purchase and damages during transportation.
(3) Failures due to the use out of product specifications.
(4) Failures due to fire, earthquake, lightning strike, wind and flood damage, salt pollution, abnormal voltage, and other natural disasters and accidents.
(5) Failures due to penetration of water, oil, metal, or any other foreign materials.
(6) Failures of internal components, which exceeded their described standard life.

13-2 Warranty scope

During the warranty period, we will only replace or repair the defective single product we delivered, if the failure is caused due to our fault. In the above, our responsibility is limited to the replacement or repair of the above single product we delivered. We are not liable for any damage to you or a third party, caused in association with the failure of the product we delivered. Further, we are not liable for any failure and damage to you or a third party, caused by the above 13-1exemptions and any one of the following.

(1) Failures due to the mounting or use of our product against the instructions and warnings described in this specification.
(2) Failures due to the combination of our product and the equipment that mounted our product.
(3) Failures due to your negligence of our instructions described in this specification.
(4) Other equipment failures not attributable to our responsibility.

13-3 Warranty service

Please contact your dealers when you need to apply for warranty, including investigation of failure cause and request for repair. If you return our product directly to Panasonic Motor, after obtaining an approval from your dealer, please obtain the application form for repair and investigation from your dealer, enter the necessary information on it, and attach it to our product. In principle, you need to pay the transportation cost.

14. Other

(1) Precautions for export of this product and the equipment incorporating this product.
If the end user or end purpose of this product relates to military affairs, armament and so on, this product may be subject to the export regulations prescribed in “Foreign Exchange and Foreign Trade Control Law.” To export this product, take thorough examination, and follow the required export procedure.

(2) This product was designed to be used with general industrial products or the like. It is not designed to be used with a device dealing with human life or as a device to be used in unusual circumstances such as nuclear power management, use with aerospace instruments, use in transportation, use with medical equipment, use with various types of safety devices, or use with a device for which high level of cleanliness is required.

(3) Please make the final decision at customer as to the specification of the completed product, compliance with laws and regulations, and its compatibility with the equipment and parts attached by customer in respects such as the structure, dimensions, service life, and characteristics.

(4) There is a possibility that the completed device of customer may malfunction due to troubles (such as signal disconnection and signal phase interruption) or operation out of the setting by applying external noise/static electricity. Therefore, customer is required to make a fail-safe design and secure safety within the operable range in the place of operation.

(5) Since excessive loading of the product may be the cause of load collapsing, follow the instructions indicated.

(6) When the motor is to be operated without electrically connecting the shaft of the motor to the ground, depending on the actual equipment and the installing environment, problems such as the bearing sound will be louder may occur due to the occurrence of electrical corrosion at the motor bearing. So please confirm and verify the matter at customer.

(7) Apply adequate tightening torque to the product mounting screw by taking into consideration strength of the screw and the characteristics of material to which the product is installed.

(8) There is a possibility that the noise resistance performance may be affected depending on the wiring conditions (such as a grounding method, cable length, and shielding state of signal wires). Therefore, customer’s completed devices should also be checked for the noise resistance performance.

(9) When discarding the product, dispose it as an industrial waste.

(10) When discarding the battery, isolate the battery with a tape or the like, and discard it according to the regulations of the local government.

(11) Some of the parts or the like may be modified to improve the performance, but the improvement will be implemented within the range of satisfying the items in this specification.

(12) The specification change of the product shall be implemented with the specification delivered by our company or a document specified by customer. And when the functions or characteristics are affected, the specification will be changed after being verified and confirmed with a prototype.

(13) When the specification is changed, the price may also be changed in some cases.

(14) If there is an item other than the items described in this specification and needs to be specified, please notify us beforehand.

(15) If malfunctioning has occurred, the matter shall be addressed by discussing the matter with both parties according to the items indicated in this specification.

(16) Failure of this product depending on its content, may generate smoke of about one cigarette.
Take this into consideration when the application of the machine is clean room related.

(17) Do not use benzene, thinner, alcohol, and acid or alkaline detergent, because they can discolor and damage the product.

Specification for Each Model

● MINAS-A5BD1 Series

• Size A 100 V and 200 V

Model	MADHT1105BD1	MADHT1107BD1	MADHT1505BD1	MADHT1507BD1
Power supply input	Single phase 100 V	Single phase 100 V	Single phase/ 3 phase 200 V	Single phase/ 3 phase 200 V
Maximum instantaneous output current	10 A	10 A	10 A	10 A
Maximum continuous output current	5 A	7. 5 A	5 A	7. 5 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Externally connected	Externally connected	Externally connected	Externally connected
Auto gain tuning function	Provided	Provided	Provided	Provided
Dynamic brake function	Provided	Provided	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE	Available NOTE	Available NOTE
Safety function	Unprovided	Unprovided	Unprovided	Unprovided
Ambient temperature	0–55°C	0–55°C	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.75mm²
	AWG18	AWG18	AWG18	AWG18
Main power supply cable	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²
	AWG14–18	AWG14–18	AWG14–18	AWG14–18
Ground cable	HVSF 2. 0 mm²	HVSF 2. 0 mm²	HVSF 2. 0 mm²	HVSF 2. 0 mm²
	AWG14	AWG14	AWG14	AWG14
Motor cable	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²
	AWG14–18	AWG14–18	AWG14–18	AWG14–18
Inrush Current (Main Power Supply) *2	Max. 7 A	Max. 7 A	Max. 14 A	Max. 14 A
Inrush Current (Control Power Supply) *2	Max. 14 A	Max. 14 A	Max. 28 A	Max. 28 A
Weight	Approx. 0.8 kg	Approx. 0.8 kg	Approx. 0.8 kg	Approx. 0.8 kg
Dimensions	Size A	Size A	Size A	Size A

*1 When using an encoder with the specification of 17-bit incremental/absolute.

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 100 V or 200 V.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5BD1 Series

• Size B 100 V and 200 V

Model	MBDHT2110BD1	MBDHT2510BD1
Power supply input	Single phase 100 V	Single phase/ 3 phase 200 V
Maximum instantaneous output current	15 A	15 A
Maximum continuous output current	10 A	10 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Externally connected	Externally connected
Auto gain tuning function	Provided	Provided
Dynamic brake function	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE
Safety function	Unprovided	Unprovided
Ambient temperature	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²
	AWG18	AWG18
Main power supply cable	HVSF 0.75–2.0 mm²	HVSF 0.75–2.0 mm²
	AWG14–18	AWG14–18
Ground cable	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14
Motor cable	HVSF 0.75–2.0 mm²	HVSF 0.75–2.0 mm²
	AWG14–18	AWG14–18
Inrush current (Main power supply) *2	Max. 7 A	Max. 14 A
Inrush current (Control power supply) *2	Max. 14 A	Max. 28 A
Weight	Approx. 1.0 kg	Approx. 1.0 kg
Dimensions	Size B	Size B

*1 When using an encoder with the specification of 17-bit incremental/absolute.

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 100 V or 200 V.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5BD1 Series

• Size C 100 V and 200 V

Model	MCDHT3120BD1	MCDHT3520BD1
Power supply input	Single phase 100 V	Single phase/ 3 phase 200 V
Maximum instantaneous output current	30 A	30 A
Maximum continuous output current	20 A	20 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Built-in	Built-in
Auto gain tuning function	Provided	Provided
Dynamic brake function	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE
Safety function	Unprovided	Unprovided
Ambient temperature	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²
	AWG18	AWG18
Main power supply cable	HVSF 0.75–2.0 mm²	HVSF 0.75–2.0 mm²
	AWG14–18	AWG14–18
Ground cable	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14
Motor cable	HVSF 0.75–2.0 mm²	HVSF 0.75–2.0 mm²
	AWG14–18	AWG14–18
Inrush current (Main power supply) *2	Max. 15 A	Max. 29 A
Inrush current (Control power supply) *2	Max. 14 A	Max. 28 A
Weight	Approx.1.6 kg	Approx.1.6 kg
Dimensions	Size C	Size C

*1 When using an encoder with the specification of 17-bit incremental/absolute.

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 100 V or 200 V.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5BD1 Series

• Size D 200 V and 400 V

Model	MDDHT3530BD1	MDDHT5540BD1	MDDHT2407BD1	MDDHT2412BD1	MDDHT3420BD1
Power supply input	Single phase/ 3 phase 200 V	Single phase/ 3 phase 200 V	3 phase 400 V	3 phase 400 V	3 phase 400 V
Max. instantaneous output current	50 A	50 A	15 A	15 A	30 A
Max. continuous output current	30 A	40 A	7.5 A	12 A	20 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Built-in	Built-in	Built-in	Built-in	Built-in
Auto gain tuning function	Provided	Provided	Provided	Provided	Provided
Dynamic brake function	Provided	Provided	Provided	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE	Available NOTE	Available NOTE	Available NOTE
Safety function	Unprovided	Unprovided	Unprovided	Unprovided	Unprovided
Ambient temperature	0–55°C	0–55°C	0–55°C	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.5mm²	HVSF 0.5mm²	HVSF 0.5mm²
	AWG18	AWG18	AWG20	AWG20	AWG20
Main power supply cable	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14	AWG14	AWG14	AWG14
Ground cable	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14	AWG14	AWG14	AWG14
Motor cable	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14	AWG14	AWG14	AWG14
Inrush current (Main power supply) *2	Max. 29 A	Max. 29 A	Max. 28 A	Max. 28 A	Max. 28 A
Inrush current (Control power supply) *2	Max. 28 A	Max. 28 A	Max. 48 A	Max. 48 A	Max. 48 A
Weight	Approx. 1.8 kg	Approx. 1.8 kg	Approx. 1.9 kg	Approx. 1.9 kg	Approx. 1.9 kg
Dimensions	Size D	Size D	Size D	Size D	Size D

*1 When using Encoder Specifications: 17 bit incremental/absolute

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 200 V, 400 V or 24 V dc.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5BD1 Series

• Size E 200 V and 400 V

Model	MEDHT7364BD1	MEDHT4430BD1
Power supply input	3 phase 200 V	3 phase 400 V
Maximum instantaneous output current	75 A	35 A
Maximum continuous output current	64 A	30 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Built-in	Built-in
Auto gain tuning function	Provided	Provided
Dynamic brake function	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE
Safety function	Unprovided	Unprovided
Ambient temperature	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.5mm²
	AWG18	AWG20
Main power supply cable	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14
Ground cable	HVSF 3.5 mm²	HVSF 2.0 mm²
	AWG12	AWG14
Motor cable	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14
Inrush current (Main power supply) *2	Max. 29 A	Max. 32 A
Inrush current (Control power supply) *2	Max. 14 A	Max. 48 A
Weight	Approx. 2.7 kg	Approx. 2.7 kg
Dimensions	Size E	Size E

*1 When using Encoder Specifications: 17 bit incremental/absolute

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 200 V, 400 V or 24 V dc.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5BD1 Series

• Size F 200 V and 400 V

Model	MFDHTA390BD1	MFDHTB3A2BD1	MFDHT5440BD1	MFDHTA464BD1
Power supply input	3 phase 200 V	3 phase 200 V	3 phase 400 V	3 phase 400 V
Maximum instantaneous output current	100 A	150 A	50 A	100 A
Maximum continuous output current	90 A	120 A	40 A	64 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Built-in	Built-in	Built-in	Built-in
Auto gain tuning function	Provided	Provided	Provided	Provided
Dynamic brake function	Provided	Provided	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE	Available NOTE	Available NOTE
Safety function	Unprovided	Unprovided	Unprovided	Unprovided
Ambient temperature	0–55°C	0–55°C	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.75mm²
	AWG18	AWG18	AWG18	AWG18
Main power supply cable	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²
	AWG12	AWG12	AWG12	AWG12
Ground cable	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²
	AWG12	AWG12	AWG12	AWG12
Motor cable	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²
	AWG12	AWG12	AWG12	AWG12
Inrush current (Main power supply) *2	Max. 22 A	Max. 22 A	Max. 32 A	Max. 32 A
Inrush current (Control power supply) *2	Max. 14 A	Max. 14 A	Max. 48 A	Max. 48 A
Weight	Approx. 4.8 kg	Approx. 4.8 kg	Approx. 4.7 kg	Approx. 4.7 kg
Dimensions	Size F	Size F	Size F	Size F

*1 When using Encoder Specifications: 17 bit incremental/absolute

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 200 V, 400 V or 24 V dc.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5B21 Series

• Size A 100 V and 200 V

Model	MADHT1105B21	MADHT1107B21	MADHT1505B21	MADHT1507B21
Power supply input	Single phase 100 V	Single phase 100 V	Single phase/ 3 phase 200 V	Single phase/ 3 phase 200 V
Maximum instantaneous output current	10 A	10 A	10 A	10 A
Maximum continuous output current	5 A	7. 5 A	5 A	7. 5 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Externally connected	Externally connected	Externally connected	Externally connected
Auto gain tuning function	Provided	Provided	Provided	Provided
Dynamic brake function	Provided	Provided	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE	Available NOTE	Available NOTE
Safety function	Provided	Provided	Provided	Provided
Ambient temperature	0–55°C	0–55°C	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.75mm²
	AWG18	AWG18	AWG18	AWG18
Main power supply cable	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²
	AWG14–18	AWG14–18	AWG14–18	AWG14–18
Ground cable	HVSF 2. 0 mm²	HVSF 2. 0 mm²	HVSF 2. 0 mm²	HVSF 2. 0 mm²
	AWG14	AWG14	AWG14	AWG14
Motor cable	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²	HVSF 0. 75–2. 0 mm²
	AWG14–18	AWG14–18	AWG14–18	AWG14–18
Inrush Current (Main Power Supply) *2	Max. 7 A	Max. 7 A	Max. 14 A	Max. 14 A
Inrush Current (Control Power Supply) *2	Max. 14 A	Max. 14 A	Max. 28 A	Max. 28 A
Weight	Approx. 0.8 kg	Approx. 0.8 kg	Approx. 0.8 kg	Approx. 0.8 kg
Dimensions	Size A	Size A	Size A	Size A

*1 When using an encoder with the specification of 17-bit incremental/absolute.

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 100 V or 200 V.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5B21 Series

• Size B 100 V and 200 V

Model	MBDHT2110B21	MBDHT2510B21
Power supply input	Single phase 100 V	Single phase/ 3 phase 200 V
Maximum instantaneous output current	15 A	15 A
Maximum continuous output current	10 A	10 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Externally connected	Externally connected
Auto gain tuning function	Provided	Provided
Dynamic brake function	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE
Safety function	Provided	Provided
Ambient temperature	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²
	AWG18	AWG18
Main power supply cable	HVSF 0.75–2.0 mm²	HVSF 0.75–2.0 mm²
	AWG14–18	AWG14–18
Ground cable	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14
Motor cable	HVSF 0.75–2.0 mm²	HVSF 0.75–2.0 mm²
	AWG14–18	AWG14–18
Inrush current (Main power supply) *2	Max. 7 A	Max. 14 A
Inrush current (Control power supply) *2	Max. 14 A	Max. 28 A
Weight	Approx. 1.0 kg	Approx. 1.0 kg
Dimensions	Size B	Size B

*1 When using an encoder with the specification of 17-bit incremental/absolute.

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 100 V or 200 V.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5B21 Series

• Size C 100 V and 200 V

Model	MCDHT3120B21	MCDHT3520B21
Power supply input	Single phase 100 V	Single phase/ 3 phase 200 V
Maximum instantaneous output current	30 A	30 A
Maximum continuous output current	20 A	20 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Built-in	Built-in
Auto gain tuning function	Provided	Provided
Dynamic brake function	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE
Safety function	Provided	Provided
Ambient temperature	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²
	AWG18	AWG18
Main power supply cable	HVSF 0.75–2.0 mm²	HVSF 0.75–2.0 mm²
	AWG14–18	AWG14–18
Ground cable	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14
Motor cable	HVSF 0.75–2.0 mm²	HVSF 0.75–2.0 mm²
	AWG14–18	AWG14–18
Inrush current (Main power supply) *2	Max. 15 A	Max. 29 A
Inrush current (Control power supply) *2	Max. 14 A	Max. 28 A
Weight	Approx.1.6 kg	Approx.1.6 kg
Dimensions	Size C	Size C

*1 When using an encoder with the specification of 17-bit incremental/absolute.

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 100 V or 200 V.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5B21 Series

• Size D 200 V and 400 V

Model	MDDHT3530B21	MDDHT5540B21	MDDHT2407B21	MDDHT2412B21	MDDHT3420B21
Power supply input	Single phase/ 3 phase 200 V	Single phase/ 3 phase 200 V	3 phase 400 V	3 phase 400 V	3 phase 400 V
Max. instantaneous output current	50 A	50 A	15 A	15 A	30 A
Max. continuous output current	30 A	40 A	7.5 A	12 A	20 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Built-in	Built-in	Built-in	Built-in	Built-in
Auto gain tuning function	Provided	Provided	Provided	Provided	Provided
Dynamic brake function	Provided	Provided	Provided	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE	Available NOTE	Available NOTE	Available NOTE
Safety function	Provided	Provided	Provided	Provided	Provided
Ambient temperature	0–55°C	0–55°C	0–55°C	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.5mm²	HVSF 0.5mm²	HVSF 0.5mm²
	AWG18	AWG18	AWG20	AWG20	AWG20
Main power supply cable	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2
	AWG14	AWG14	AWG14	AWG14	AWG14
Ground cable	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2
	AWG14	AWG14	AWG14	AWG14	AWG14
Motor cable	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2	HVSF 2.0 mm^2
	AWG14	AWG14	AWG14	AWG14	AWG14
Inrush current (Main power supply) *2	Max. 29 A	Max. 29 A	Max. 28 A	Max. 28 A	Max. 28 A
Inrush current (Control power supply) *2	Max. 28 A	Max. 28 A	Max. 48 A	Max. 48 A	Max. 48 A
Weight	Approx. 1.8 kg	Approx. 1.8 kg	Approx. 1.9 kg	Approx. 1.9 kg	Approx. 1.9 kg
Dimensions	Size D	Size D	Size D	Size D	Size D

*1 When using Encoder Specifications: 17 bit incremental/absolute

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 200 V, 400 V or 24 V dc.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5B21 Series

• Size E 200 V and 400 V

Model	MEDHT7364B21	MEDHT4430B21
Power supply input	3 phase 200 V	3 phase 400 V
Maximum instantaneous output current	75 A	35 A
Maximum continuous output current	64 A	30 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Built-in	Built-in
Auto gain tuning function	Provided	Provided
Dynamic brake function	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE
Safety function	Provided	Provided
Ambient temperature	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.5mm²
	AWG18	AWG20
Main power supply cable	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14
Ground cable	HVSF 3.5 mm²	HVSF 2.0 mm²
	AWG12	AWG14
Motor cable	HVSF 2.0 mm²	HVSF 2.0 mm²
	AWG14	AWG14
Inrush current (Main power supply) *2	Max. 29 A	Max. 32 A
Inrush current (Control power supply) *2	Max. 14 A	Max. 48 A
Weight	Approx. 2.7 kg	Approx. 2.7 kg
Dimensions	Size E	Size E

*1 When using Encoder Specifications: 17 bit incremental/absolute

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 200 V, 400 V or 24 V dc.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5B21 Series

• Size F 200 V and 400 V

Model	MFDHTA390B21	MFDHTB3A2B21	MFDHT5440B21	MFDHTA464B21
Power supply input	3 phase 200 V	3 phase 200 V	3 phase 400 V	3 phase 400 V
Maximum instantaneous output current	100 A	150 A	50 A	100 A
Maximum continuous output current	90 A	120 A	40 A	64 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Built-in	Built-in	Built-in	Built-in
Auto gain tuning function	Provided	Provided	Provided	Provided
Dynamic brake function	Provided	Provided	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE	Available NOTE	Available NOTE
Safety function	Provided	Provided	Provided	Provided
Ambient temperature	0–55°C	0–55°C	0–55°C	0–55°C
Control power supply cable	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.75mm²	HVSF 0.75mm²
	AWG18	AWG18	AWG18	AWG18
Main power supply cable	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²
	AWG12	AWG12	AWG12	AWG12
Ground cable	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²
	AWG12	AWG12	AWG12	AWG12
Motor cable	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²	HVSF 3.5 mm²
	AWG12	AWG12	AWG12	AWG12
Inrush current (Main power supply) *2	Max. 22 A	Max. 22 A	Max. 32 A	Max. 32 A
Inrush current (Control power supply) *2	Max. 14 A	Max. 14 A	Max. 48 A	Max. 48 A
Weight	Approx. 4.8 kg	Approx. 4.8 kg	Approx. 4.7 kg	Approx. 4.7 kg
Dimensions	Size F	Size F	Size F	Size F

*1 When using Encoder Specifications: 17 bit incremental/absolute

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 200 V, 400 V or 24 V dc.

Note: The absolute encoder backup battery is externally connected.

● MINAS-A5B21 Series

• Sizes G/H 200 V and 400 V

Model	MGDHTC3B4B21	MGDHTB4A2B21	MHDHTC3B4B21	MHDHTB4A2B21
Power supply input	3 phase 200 V	3 phase 400 V	3 phase 200 V	3 phase 400 V
Maximum instantaneous output current	300 A	150 A	300 A	150 A
Maximum continuous output current	240 A	120 A	240 A	120 A
Rotary encoder feedback signal	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r	Resolution: 1048576 P/r
	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r	Resolution: 131072 P/r
Regenerative discharge resistor	Externally connected	Externally connected	Externally connected	Externally connected
Auto gain tuning function	Provided	Provided	Provided	Provided
Dynamic brake function	Provided	Provided	Provided	Provided
Absolute system *1	Available NOTE	Available NOTE	Available NOTE	Available NOTE
Safety function	Provided	Provided	Provided	Provided
Ambient temperature	0–55°C	0–55°C	0–55°C	0–55°C
Control power cable	HVSF 0.75 mm^2	HVSF 0.75mm^2	HVSF 0.75 mm^2	HVSF 0.75 mm^2
	AWG18	AWG18	AWG18	AWG18
Main power supply cable	HVSF 5.3 mm^2	HVSF 5.3mm^2	HVSF 13.3 mm^2	HVSF 13.3 mm^2
	AWG10	AWG10	AWG6	AWG6
Ground cable	HVSF 13.3 mm^2	HVSF 13.3 mm^2	HVSF 21.1 mm^2	HVSF 21.1 mm^2
	AWG6	AWG6	AWG4	AWG4
Motor cable	HVSF 13.3 mm^2	HVSF 13.3 mm^2	HVSF 21.1 mm^2	HVSF 21.1 mm^2
	AWG6	AWG6	AWG4	AWG4
Inrush current (Main power supply) *2	Max. 66 A	Max. 32 A	Max. 66 A	Max. 32 A
Inrush current (Control power supply) *2	Max. 15 A	Max. 48 A	Max. 15 A	Max. 48 A
Weight	Approx. 13.5 kg	Approx. 13.5 kg	Approx. 21 kg	Approx. 21 kg
Dimensions	Size G	Size G	Size H	Size H

*1 When using Encoder Specifications: 17 bit incremental/absolute

*2 Current values were calculated on the basis of the power supply input described above, assuming a voltage of 200 V, 400V and 24 V dc.

Note: The absolute encoder backup battery is externally connected.

I/O connector (X4) default function allocation

X4 connector		Default function		
Name	Pin number	Signal name	Symbol	Logic
SI1	5	General monitor input 5	SI-MON5	NO contact
SI2	7	CW drive inhibit input	POT	NC contact
SI3	8	CCW drive inhibit input	NOT	NC contact
SI4	9	Near origin input	HOME	NO contact
SI5	10	External latch input1	EXT1	NO contact
SI6	11	External latch input 2	EXT2	NO contact
SI7	12	General monitor input 3	SI-MON3	NO contact
SI8	13	General monitor input 4	SI-MON4	NO contact
SO1	1,2	External brake release signal	BRK-OFF	NO contact
SO2	25,26	ECAT operation output 1	EX-OUT1	NO contact
SO3	3,4	Alarm output	ALM	NC contact