



General-Purpose AC Servo

MELSERVO

Large-Capacity Servo

MODEL

MR-HP30KA/55KA4

CONVERTER UNIT INSTRUCTION MANUAL

The corresponding manuals indicated below are required to use the Large-Capacity Servo.

● MR-J2S-30KA・37KA

Manual Name	Manual NO.
MR-J2S-□A Servo Amplifier Instruction Manual	SH(NA)030006
Servo Motor Instruction Manual	SH(NA)3181

● MR-J2S-30KA4 to 55KA4

Manual Name	Manual NO.
MR-J2S-□A Servo Amplifier Instruction Manual	SH(NA)030006
Servo Motor Instruction Manual	SH(NA)3181

● MR-J2S-30KB・37KB

Manual Name	Manual NO.
MR-J2S-□B Servo Amplifier Instruction Manual	SH(NA)030007
Servo Motor Instruction Manual	SH(NA)3181

● MR-J2S-30KB4 to 55KB4

Manual Name	Manual NO.
MR-J2S-□B Servo Amplifier Instruction Manual	SH(NA)030007
Servo Motor Instruction Manual	SH(NA)3181

● MR-H30KAN・37KAN

Manual Name	Manual NO.
MR-H□AN Servo Amplifier Instruction Manual	SH(NA)3190
Servo Motor Instruction Manual	SH(NA)3181

● MR-H30KAN4 to 55KAN4

Manual Name	Manual NO.
MR-H□AN Servo Amplifier Instruction Manual	SH(NA)3190
Servo Motor Instruction Manual	SH(NA)3181

● MR-H30KBN・37KBN

Manual Name	Manual NO.
MR-H□BN Servo Amplifier Instruction Manual	SH(NA)3192
Servo Motor Instruction Manual	SH(NA)3181

● MR-H30KBN4 to 55KBN4

Manual Name	Manual NO.
MR-H□BN Servo Amplifier Instruction Manual	SH(NA)3192
Servo Motor Instruction Manual	SH(NA)3181

● Safety Instructions ●

(Always read these instructions before using the equipment.)

Do not attempt to install, operate, maintain or inspect the servo amplifier and servo motor until you have read through this Specifications and Instruction guide, Installation guide, Servo motor Instruction Manual and appended documents carefully and can use the equipment correctly. Do not use the servo amplifier and servo motor until you have a full knowledge of the equipment, safety information and instructions.

In this Instruction Manual, the safety instruction levels are classified into "WARNING" and "CAUTION".



Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to personnel or may cause physical damage.

Note that the CAUTION level may lead to a serious consequence according to conditions. Please follow the instructions of both levels because they are important to personnel safety.

What must not be done and what must be done are indicated by the following diagrammatic symbols:

 : Indicates what must not be done. For example, "No Fire" is indicated by .

 : Indicates what must be done. For example, grounding is indicated by .

In this Specifications and Instruction Manual, instructions at a lower level than the above, instructions for other functions, and so on are classified into "POINT".

After reading this installation guide, always keep it accessible to the operator.

1. To prevent electric shock, note the following:

 **CAUTION**

- Before wiring or inspection, switch power off and wait for more than 20 minutes. Then, confirm the voltage is safe with voltage tester. Otherwise, you may get an electric shock.
- Connect the Converter unit to ground.
- Any person who is involved in wiring and inspection should be fully competent to do the work.
- Do not attempt to wire the converter unit until they have been installed. Otherwise, you may get an electric shock.
- Operate the switches with dry hand to prevent an electric shock.
- The cables should not be damaged, stressed loaded, or pinched. Otherwise, you may get an electric shock.
- During power-on or operation, do not open the front cover of the converter unit and the servo amplifier. You may get an electric shock.
- Do not operate the Converter unit and the servo amplifier with the front cover removed. High-voltage terminals and charging area are exposed and you may get an electric shock.
- Except for wiring or periodic inspection, do not remove the front cover even if the power is off. The Converter unit is charged and you may get an electric shock.

2. To prevent fire, note the following:

 **CAUTION**

- Do not install the converter unit and regenerative brake resistor on or near combustibles. Otherwise a fire may cause.
- When the converter unit has become faulty, switch off the main converter unit power side. continuous flow of a large current may cause a fire.
- When a regenerative brake resistor is used, use an alarm signal to switch main power off. Otherwise, a regenerative brake transistor fault or the like may overheat the regenerative brake resistor, causing a fire.

3. To prevent injury, note the follow

 **CAUTION**

- Only the voltage specified in the Instruction Manual should be applied to each terminal, Otherwise, a burst, damage, etc. may occur.
- Connect the terminals correctly to prevent a burst, damage, etc.
- Ensure that polarity (+, -) is correct. Otherwise, a burst, damage, etc. may occur.
- Take safety measures, e.g. provide covers, to prevent accidental contact of hands and parts (cables, etc.) with the servo amplifier heat sink, regenerative brake resistor, servo motor, etc. since they may be hot while power is on or for some time after power-off. Their temperatures may be high and you may get burnt or a parts may damaged.
- During operation, never touch the rotating parts of the servo motor. Doing so can cause injury.

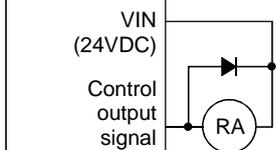
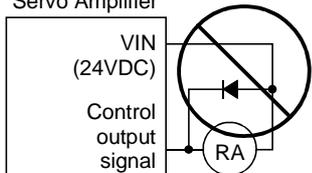
4. Additional instructions

The following instructions should also be fully noted. Incorrect handling may cause a fault, injury, electric shock, etc.

(1) Transportation and installation

⚠ CAUTION		
<ul style="list-style-type: none"> ▪ Transport the products correctly according to their masses. ▪ Stacking in excess of the specified number of products is not allowed. ▪ Do not climb or stand on servo equipment. Do not put heavy objects on equipment. ▪ The Converter unit must be installed in the specified direction. ▪ Leave specified clearances between the Converter unit and control enclosure walls or other equipment. ▪ Do not install or operate the Converter unit which has been damaged or has any parts missing. ▪ Provide adequate protection to prevent screws and other conductive matter, oil and other combustible matter from entering the Converter unit. ▪ Do not drop or strike converter unit or servo motor. Isolate from all impact loads. ▪ Use the servo amplifier and servo motor under the following environmental conditions: 		
Environment	Conditions	
	Converter unit/Servo amplifier	
Ambient temperature	During operation	[°C] 0 to +55 (non-freezing)
		[°F] 32 to 131 (non-freezing)
	In storage	[°C] -20 to +65 (non-freezing)
		[°F] -4 to 149 (non-freezing)
Ambient humidity	In operation	90%RH or less (non-condensing)
	In storage	90%RH or less (non-condensing)
Ambience		Indoors (no direct sunlight) Free from corrosive gas, flammable gas, oil mist, dust and dirt
Altitude		Max. 1000m (3280 ft) above sea level
Vibration	[m/s ²]	5.9 or less
	[ft/s ²]	19.4 or less
<ul style="list-style-type: none"> ▪ When the equipment has been stored for an extended period of time, consult Mitsubishi. 		

(2) Wiring

⚠ CAUTION	
<ul style="list-style-type: none"> ▪ Wire the equipment correctly and securely. ▪ The surge absorbing diode installed on the DC output signal relay must be wired in the specified direction. Otherwise, the emergency stop and other protective circuits may not operate. 	
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Converter unit · Servo Amplifier</p>  </div> <div style="text-align: center;"> <p>Converter unit · Servo Amplifier</p>  </div> </div>

(3) Test run adjustment

CAUTION

- Before operation, check the parameter settings. Improper settings may cause some machines to perform unexpected operation.
- The parameter settings must not be changed excessively. Operation will be insatiable.

(4) Usage

CAUTION

- Provide an external emergency stop circuit to ensure that operation can be stopped and power switched off immediately.
- Any person who is involved in disassembly and repair should be fully competent to do the work.
- Do not modify the equipment.
- Use a noise filter, etc. to minimize the influence of electromagnetic interference, which may be caused by electronic equipment used near the servo amplifier.

(5) Corrective actions

CAUTION

- When any alarm has occurred, eliminate its cause, ensure safety, and deactivate the alarm before restarting operation.

(6) Maintenance, inspection and parts replacement

CAUTION

- With age, the electrolytic capacitor of the servo amplifier will deteriorate. To prevent a secondary accident due to a fault, it is recommended to replace the electrolytic capacitor every 10 years when used in general environment.
Please consult our sales representative.

(7) General instruction

- To illustrate details, the equipment in the diagrams of this Specifications and Instruction Manual may have been drawn without covers and safety guards. When the equipment is operated, the covers and safety guards must be installed as specified. Operation must be performed in accordance with this Specifications and Instruction Manual.

● About processing of waste ●

When you discard servo amplifier, a battery (primary battery), and other option articles, please follow the law of each country (area).

FOR MAXIMUM SAFETY

- This product is not designed or manufactured to be used in equipment or systems in situations that can affect or endanger human life.
- When considering this product for operation in special applications such as machinery or systems used in passenger transportation, medical, aerospace, atomic power, electric power, or submarine repeating applications, please contact your nearest Mitsubishi sales representative.
- Although this product was manufactured under conditions of strict quality control, you are strongly advised to install safety devices to forestall serious accidents when it is used in facilities where a breakdown in the product is likely to cause a serious accident.

EEP-ROM life

The number of write times to the EEP-ROM, which stores parameter settings, etc., is limited to 100,000. If the total number of the following operations exceeds 100,000, the servo amplifier and/or converter unit may fail when the EEP-ROM reaches the end of its useful life.

- Write to the EEP-ROM due to parameter setting changes
- Home position setting in the absolute position detection system
- Write to the EEP-ROM due to device changes

COMPLIANCE WITH EC DIRECTIVES

1. WHAT ARE EC DIRECTIVES?

The EC directives were issued to standardize the regulations of the EU countries and ensure smooth distribution of safety-guaranteed products. In the EU countries, the machinery directive (effective in January, 1995), EMC directive (effective in January, 1996) and low voltage directive (effective in January, 1997) of the EC directives require that products to be sold should meet their fundamental safety requirements and carry the CE marks (CE marking). CE marking applies to machines and equipment into which servo amplifiers have been installed.

(1) EMC directive

The EMC directive applies not to the servo units alone but to servo-incorporated machines and equipment. This requires the EMC filters to be used with the servo-incorporated machines and equipment to comply with the EMC directive. For specific EMC directive conforming methods, refer to the EMC Installation Guidelines (IB(NA)67310).

(2) Low voltage directive

The low voltage directive applies also to servo units alone. Hence, they are designed to comply with the low voltage directive.

This servo is certified by TUV, third-party assessment organization, to comply with the low voltage directive.

(3) Machine directive

Not being machines, the servo amplifiers need not comply with this directive.

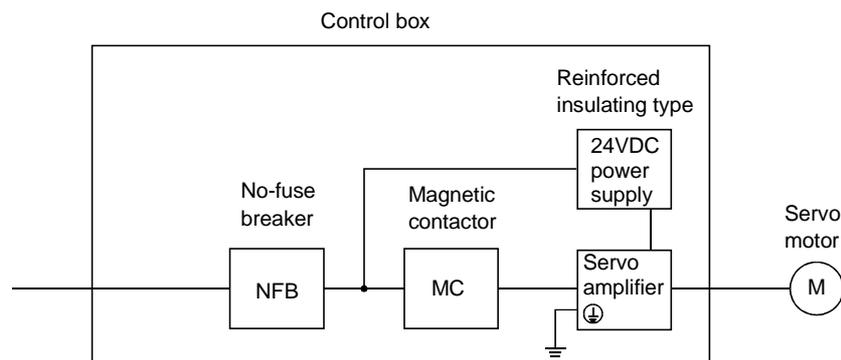
2. PRECAUTIONS FOR COMPLIANCE

(1) Servo amplifiers and servo motors used

Use the converter unit, servo amplifiers and servo motors which comply with the standard model.

Converter unit :MR-HP30KA · MR-HP55KA4
Servo amplifier series :MR-J2S-30K□ · MR-J2S-37K□
MR-J2S-30K□4 to MR-J2S-55K□4
Servo motor series :HA-LFS□

(2) Configuration



(3) Environment

Operate the servo amplifier at or above the contamination level 2 set forth in IEC60664-1. For this purpose, install the servo amplifier in a control box which is protected against water, oil, carbon, dust, dirt, etc. (IP54).

(4) Power supply

- (a) Operate the servo amplifier to meet the requirements of the overvoltage category III set forth in IEC60664-1.
- (b) When supplying interface power from external, use a 24VDC power supply which has been insulation-reinforced in I/O.

(5) Grounding

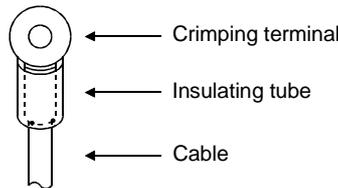
- (a) To prevent an electric shock, always connect the protective earth (PE) terminals (marked ⊕) of the servo amplifier to the protective earth (PE) of the control box.
- (b) Do not connect two ground cables to the same protective earth (PE) terminal. Always connect the cables to the terminals one-to-one.



- (c) If a leakage current breaker is used to prevent an electric shock, the protective earth (PE) terminals of the servo amplifier must be connected to the corresponding earth terminals.

(6) Wiring

The cables to be connected to the terminal block of the servo amplifier must have crimping terminals provided with insulating tubes to prevent contact with adjacent terminals.



(7) Auxiliary equipment and options

- (a) The no-fuse breaker and magnetic contactor used should be the EN or IEC standard-compliant products of the models described in Section 10.1.3, 10.2.3.
- (b) The sizes of the cables described in Section 10.3.3 meet the following requirements. To meet the other requirements, follow Table 5 and Appendix C in EN60204-1.
 - Ambient temperature: 40 (104) [°C (°F)]
 - Sheath: PVC (polyvinyl chloride)
 - Installed on wall surface or open table tray

- (c) Use the EMC filter for noise reduction.

Servo amplifier	(Note) Recommended EMC filter
MR-J2S-30KA/B · MR-J2S-37KA/B	TF3150C-TX
MR-J2S-30KA4/B4 to MR-J2S-45KA4/B4)	TF3150C-TX
MR-J2S-55KA4/B4	TF3200C-TX

Note. Soshin Electric A surge protector is separately required to use any of these EMC filters.
(Refer to the EMC Installation Guidelines)

(8) Performing EMC tests

When EMC tests are run on a machine/device into which the servo amplifier has been installed, it must conform to the electromagnetic compatibility (immunity/emission) standards after it has satisfied the operating environment/electrical equipment specifications. For the other EMC directive guidelines on the servo amplifier, refer to the EMC Installation Guidelines(IB(NA)67310).

<About the Manuals>

If it is the first time for you to use this servo, the optionally available Instruction Manual and Servo Motor Instruction Manual are required in addition to this Specifications and Installation Guide. Always purchase them and use the servo safely.

Relevant manuals

● MR-J2S-30KA・37KA

Manual Name	Manual No.
MR-J2S-□A Servo Amplifier Instruction Manual	SH(NA)030006
Servo Motor Instruction Manual	SH(NA)3181

● MR-J2S-30KA4 to 55KA4

Manual Name	Manual No.
MR-J2S-□A Servo Amplifier Instruction Manual	SH(NA)030006
Servo Motor Instruction Manual	SH(NA)3181

● MR-J2S-30KB・37KB

Manual Name	Manual No.
MR-J2S-□B Servo Amplifier Instruction Manual	SH(NA)030007
Servo Motor Instruction Manual	SH(NA)3181

● MR-J2S-30KB4 to 55KB4

Manual Name	Manual No.
MR-J2S-□B Servo Amplifier Instruction Manual	SH(NA)030007
Servo Motor Instruction Manual	SH(NA)3181

● MR-H30KAN・37KAN

Manual Name	Manual No.
MR-H□AN Servo Amplifier Instruction Manual	SH(NA)3190
Servo Motor Instruction Manual	SH(NA)3181

● MR-H30KAN4 to 55KAN4

Manual Name	Manual No.
MR-H□AN Servo Amplifier Instruction Manual	SH(NA)3190
Servo Motor Instruction Manual	SH(NA)3181

● MR-H30KBN・37KBN

Manual Name	Manual No.
MR-H□BN Servo Amplifier Instruction Manual	SH(NA)3192
Servo Motor Instruction Manual	SH(NA)3181

● MR-H30KBN4 to 55KBN4

Manual Name	Manual No.
MR-H□BN Servo Amplifier Instruction Manual	SH(NA)3192
Servo Motor Instruction Manual	SH(NA)3181

CONTENTS

1. FUNCTIONS AND STRUCTURE	1- 1 to 1-14
1.1 Precautions for use of the 200V class 37kW Servo amplifier.....	1- 1
1.2 Function block diagram	1- 2
1.3 Packing list.....	1- 4
1.4 Standard specification.....	1- 5
1.4.1 Converter unit.....	1- 5
1.4.2 Servo amplifier	1- 6
1.5 Model definition	1- 7
1.5.1 Rating plate.....	1- 7
1.5.2 Model.....	1- 7
1.6 Combinations of converter units, servo amplifiers and servo motors	1- 8
1.7 Parts identification.....	1- 9
1.7.1 Converter unit (MR-HP-30KA/MR-HP55KA4)	1- 9
1.7.2 Servo amplifier	1-10
1.8 Servo system with auxiliary equipment.....	1-14
2. INSTALLATION	2- 1 to 2- 2
2.1 Environmental conditions.....	2- 1
2.2 Installation direction and clearances	2- 2
3. SIGNALS AND WIRING	3- 1 to 3-20
3.1 I/O Signals of Converter Unit (MR-HP30KA/MR-HP55KA4).....	3- 2
3.2 Connectors and signal layouts of the servo amplifiers	3- 4
3.2.1 MELSERVO-J2-Super series	3- 4
3.2.2 MELSERVO-H series.....	3- 6
3.3 Power line circuit.....	3- 8
3.3.1 Connection example.....	3- 9
3.3.2 Terminal	3-17
3.3.3 How to use the connection bars.....	3-17
3.3.4 Power-on sequence.....	3-18
3.4 Servo motor side details.....	3-19
3.5 Grounding.....	3-20
4. DISPLAY SECTION AND OPERATION SECTION OF THE CONVERTER UNIT	4- 1 to 4- 6
4.1 Display flowchart.....	4- 1
4.2 Status display mode	4- 2
4.2.1 Display examples.....	4- 2
4.2.2 Status display list.....	4- 2
4.3 Diagnostic mode.....	4- 3
4.3.1 Diagnostic list.....	4- 3
4.3.2 External output signal indication	4- 3

4.3.3 Output signal forced output.....	4- 4
4.4 Alarm mode.....	4- 5
4.5 Parameter mode	4- 6
5. PARAMETER	5- 1 to 5- 6
5.1 Converter unit.....	5- 1
5.2 Servo amplifier.....	5- 2
5.2.1 MELSERVO-J2-Super series	5- 2
5.2.2 MELSERVO-H series.....	5- 4
6. INSPECTION	6- 1 to 6- 2
6.1 Inspection.....	6- 1
6.2 Life	6- 1
7. TROUBLESHOOTING	7- 1 to 7- 6
7.1 Converter unit.....	7- 1
7.1.1 Alarms and warning list	7- 1
7.1.2 Remedies for alarms.....	7- 1
7.1.3 Remedies for warnings.....	7- 3
7.1.4. Clearing the alarm history	7- 3
7.2 Servo amplifier.....	7- 4
7.2.1 Alarm codes.....	7- 4
7.2.2 Alarm corrective actions	7- 5
8. OUTLINE DIMENSIONAL DRAWINGS	8- 1 to 8- 8
8.1 Converter unit (MR-HP30KA/MR-HP55KA4).....	8- 1
8.2 Servo amplifier.....	8- 2
8.2.1 MELSERVO-J2-Super series	8- 2
8.2.2 MELSERVO-H series.....	8- 3
8.3 Connector.....	8- 5
9. CHARACTERISTICS	9- 1 to 9- 4
9.1 Overload protection characteristics.....	9- 1
9.2 Power supply equipment capacity and generated loss	9- 2
9.3 Dynamic brake characteristics.....	9- 4
10. OPTIONS AND AUXILIARY EQUIPMENT	10- 1 to 10-28
10.1 200V class dedicated options.....	10- 1
10.1.1 Regenerative brake option (200V class)	10- 1
10.1.2 External dynamic brake (200V class).....	10- 5
10.1.3 No-fuse breakers, magnetic contactors (200V class).....	10- 9
10.1.4 Power factor improving DC reactor (200V class).....	10- 9
10.1.5 Radio noise filter (200V class)	10-10

10.2 400V class dedicated options.....	10-11
10.2.1 Regenerative brake option (400V class)	10-11
10.2.2 External dynamic brake (400V class).....	10-15
10.2.3 No-fuse breakers, magnetic contactors (400V class).....	10-19
10.2.4 Power factor improving DC reactor (400V class).....	10-19
10.2.5 Radio noise filter (400V class)	10-20
10.3 200V/400V class shared parts	10-21
10.3.1 Cables and connectors.....	10-21
10.3.2 Heat sink outside mounting attachment (MR-ACN)	10-24
10.3.3 Recommended wires.....	10-25
10.3.4 Line noise filter (FR-BLF).....	10-26
10.3.5 Leakage current breaker.....	10-27

APPENDIX	App- 1 to App- 2
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App 1. Combination of servo amplifier and servo motor	App- 1
App 2. Parallel Connection of Two Servo Amplifiers (400V class)	App- 2

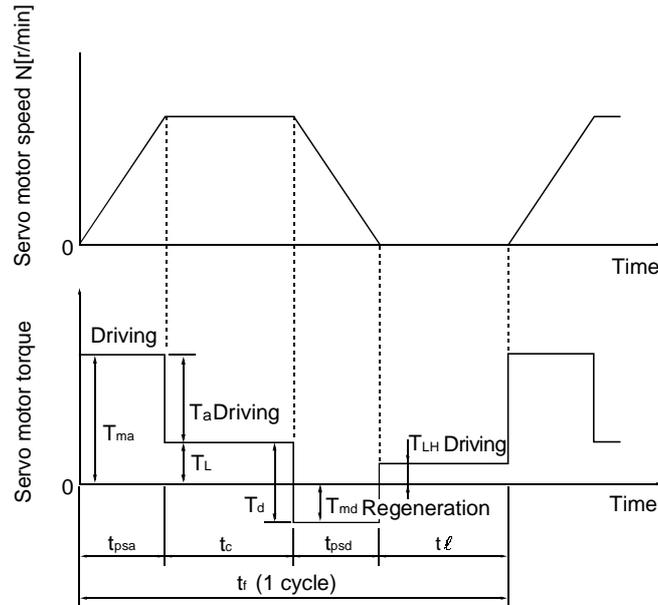
1. FUNCTIONS AND STRUCTURE

1. FUNCTIONS AND STRUCTURE

1.1 Precautions for use of the 200V class 37kW Servo amplifier

POINT
<ul style="list-style-type: none"> Please consult us when using the 200V class 37kW servo amplifier.

The 200V class 37kW servo amplifier can be used with the machine whose driving mode output is 30kW or less. The load torque in the driving mode can be used up to 81% of the rated torque.



$$T_{rms} = \sqrt{\frac{T_{ma}^2 \cdot t_{psa} + T_L^2 \cdot t_c + T_{LH}^2 \cdot t_{\ell}}{t_r}}$$

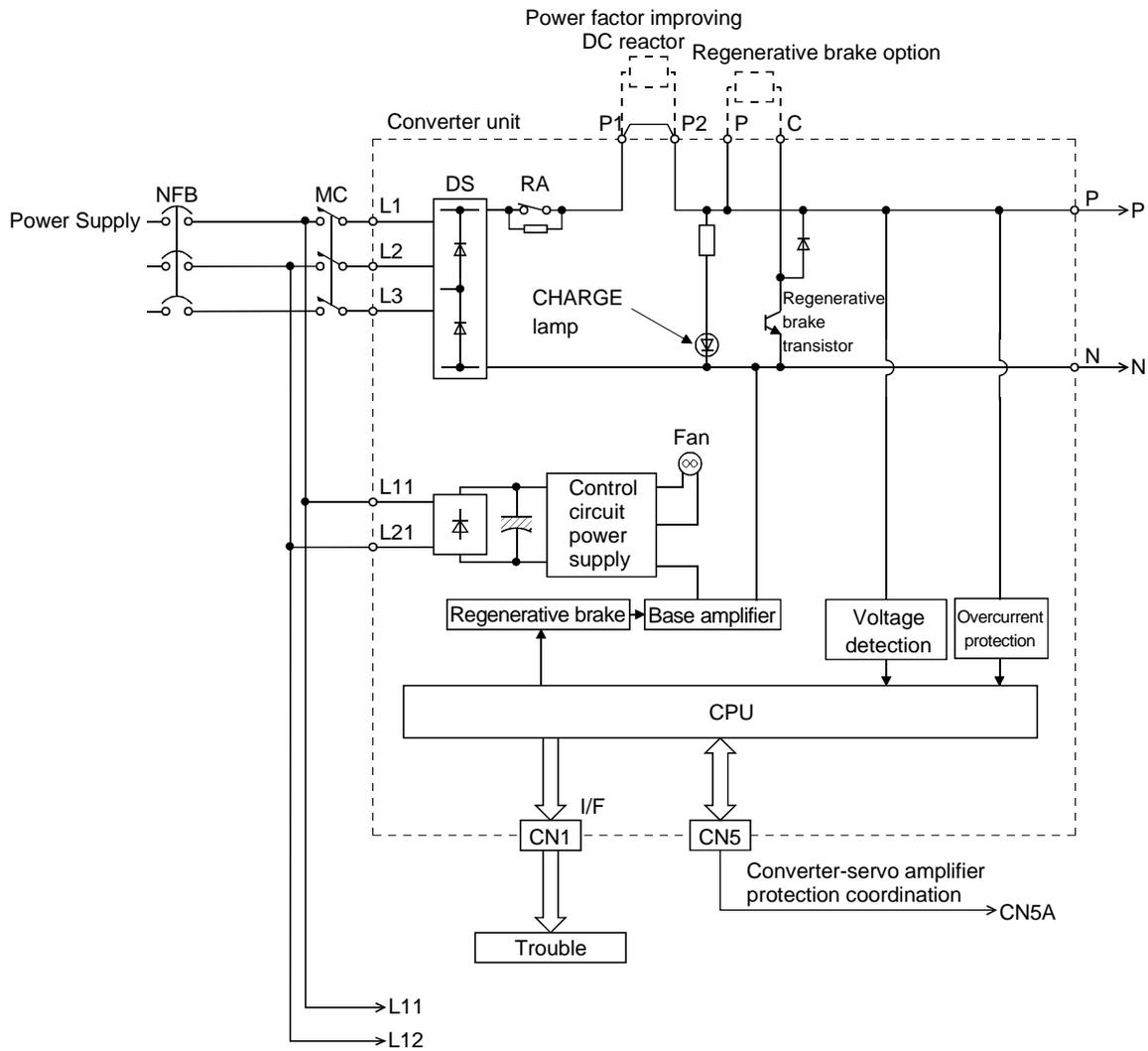
- T_{rms} : Servo motor shaft-equivalent continuous effective load torque in driving mode [N · m]
- T_{ma} : Servo motor torque necessary for acceleration [N · m]
- t_{psa} : Acceleration time [s]
- t_{psd} : Deceleration time [s]
- T_L : Servo motor shaft-equivalent load torque [N · m]
- t_c : Time at constant speed of servo motor in one cycle [s]
- T_{LH} : Torque applied at servo motor stop [N · m]
- t_{ℓ} : Stop time [s]

T_{md} (regeneration) is not added. Always make the T_{rms} value not more than 75% of the rated torque.

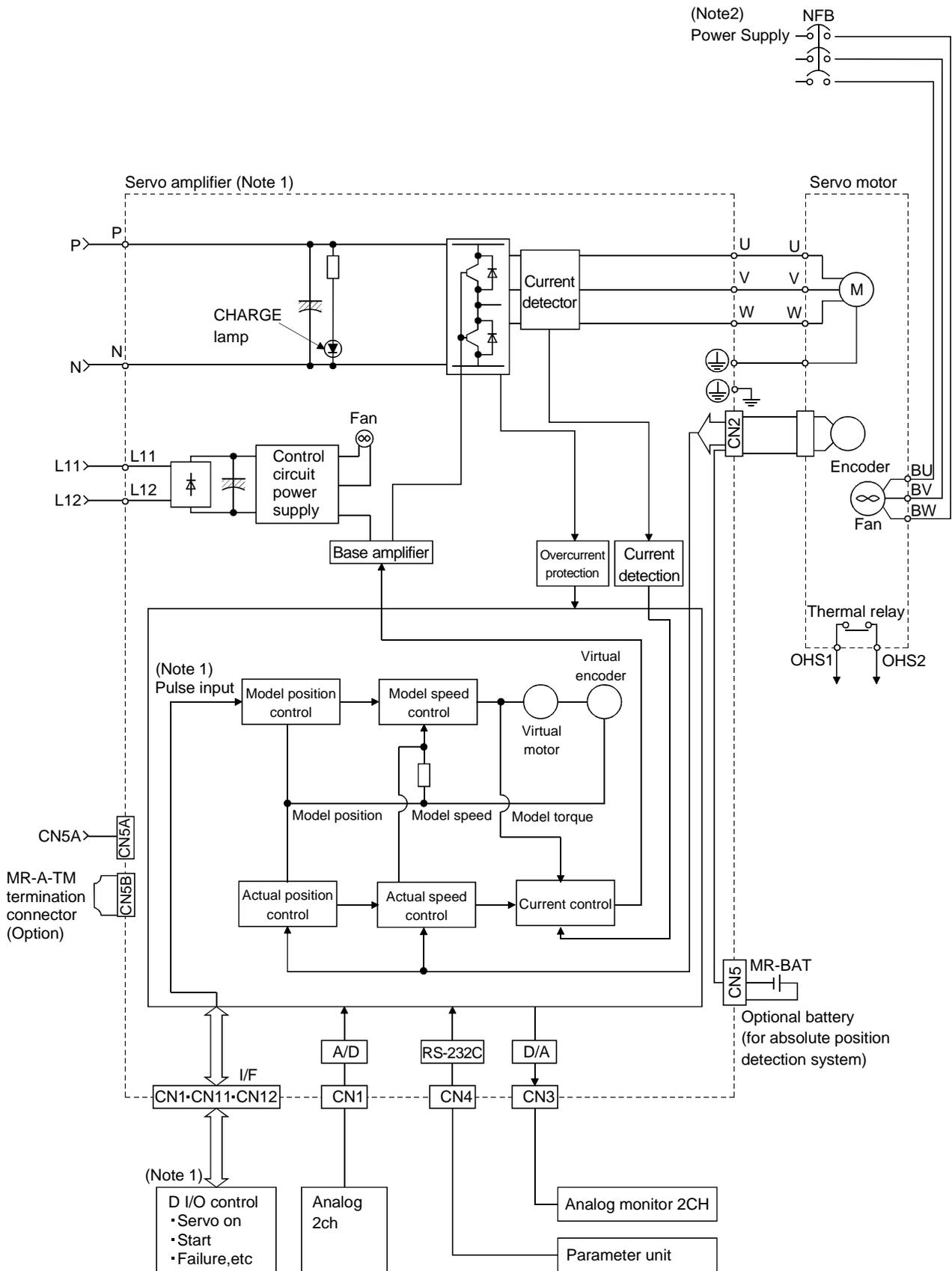
1. FUNCTIONS AND STRUCTURE

1.2 Function block diagram

The function block diagram of the Servo is shown on the next page.



1. FUNCTIONS AND STRUCTURE



Note 1. For MR-H-AN

2. Refer to Section 3.4 for the power supply specifications of the servo motor cooling fan.

1. FUNCTIONS AND STRUCTURE

1.3 Packing list

Unpack the product and check the rating plate to see if the converter unit, servo amplifier and servo motor are as you ordered.

(1) Converter unit

Model	Converter unit [units]	To Use The AC Servo Safely [manuals]
MR-HP30KA	1	1
MR-HP55KA4	1	1

(2) Servo Amplifier

POINT
<ul style="list-style-type: none"> The servo amplifier is not packed with a regenerative brake resistor. Always purchase the regenerative brake option. (Refer to Sections 10.1.1, 10.2.1.)

Model	Servo Amplifier [units]	Connection Conductor [pcs.]	Conversion Connector MR-HCN2	To Use The AC Servo Safely [manuals]
MR-J2S-30KA · MR-J2S-37KA	1	2	1	1
MR-J2S-30KB · MR-J2S-37KB				
MR-H30KAN · MR-H37KAN	1	2	/	1
MR-H30KBN · MR-H37KBN				
MR-J2S-30KA4 to MR-J2S-55KA4	1	2	1	1
MR-J2S-30KB4 to MR-J2S-55KB4				
MR-H30KAN4 to MR-H55KAN4	1	2	/	1
MR-H30KBN4 to MR-H55KBN4				

(3) Servo motor

Model	Servo motor [units]	To Use The AC Servo Safely [manuals]
HA-LFS30K2 · HA-LFS37K2 HA-LF30K2 · HA-LF37K2	1	1
HA-LFS30K24 to HA-LFS55K24 HA-LF30K24 to HA-LF55K24	1	1

1. FUNCTIONS AND STRUCTURE

1.4 Standard specification

1.4.1 Converter unit

Item		Model	MP-HP30KA	MP-HP55KA4	
Main circuit power supply	Voltage/frequency		3-phase 200 to 230VAC, 50/60Hz	3-phase 380 to 480VAC, 50/60Hz	
	Permissible voltage fluctuation		3-phase 170 to 253VAC, 50/60Hz	3-phase 323 to 528VAC, 50/60Hz	
	Permissible frequency fluctuation		Within $\pm 5\%$	Within $\pm 5\%$	
Control power supply	Voltage/frequency		1-phase 200 to 230VAC, 50/60Hz	1-phase 380 to 480VAC, 50/60Hz	
	Permissible voltage fluctuation		1-phase 170 to 235VAC, 50/60Hz	1-phase 323 to 528VAC, 50/60Hz	
	Permissible frequency fluctuation		Within $\pm 5\%$	Within $\pm 5\%$	
	Power consumption		50W	50W	
Rated output			30kw	55kw	
Regenerative power (Using regenerative brake option)			One MR-RB139: 1300W Three MR-RB139s: 3900W	One MR-RB136-4: 1300W Three MR-RB138-4: 3900W	
Protective function			Regenerative overvoltage shutoff, overload shutoff (electronic thermal protector) Regenerative alarm protection, undervoltage, instantaneous power failure protection		
Structure			Open(IP00)		
Environment	Ambient temperature	During operation	[°C]	0 to +55 (non-freezing)	
			[°F]	32 to +131 (non-freezing)	
		In storage	[°C]	-20 to +65 (non-freezing)	
			[°F]	-4 to +149 (non-freezing)	
	Ambient humidity	In operation	90%RH or less (non-condensing)		
		In storage			
	Ambient	Indoors (no direct sunlight) Free from corrosive gas, flammable gas, oil mist, dust and dirt			
	Altitude	Max. 1000m (3280ft) above sea level			
	Vibration	5.9 [m/s ²] or less			
		19.4 [ft/s ²] or less			
Mass	[kg]	22			
	[lb]	48.502			

1. FUNCTIONS AND STRUCTURE

1.4.2 Servo amplifier

(1) 200V class

Item		Servo amplifier		MR-J2S-30KA/B	MR-J2S-37KA/B	MR-H30KAN/BN	MR-H37KAN/BN
Control power supply	Voltage/frequency	Single-phase 200 to 230VAC, 50/60Hz					
	Permissible voltage fluctuation	Single-phase 170 to 253VAC, 50/60Hz					
	Permissible frequency fluctuation	Within $\pm 5\%$					
	Power consumption	50W					
Main circuit power supply		The main circuit power of the servo amplifier is supplied by the converter unit.					
Control system		Sine-wave PWM control, current control system					
Structure		Open (IP00)					
Environment	Ambient temperature	During operation	[°C]	0 to +55 (non-freezing)			
			[°F]	32 to +131 (non-freezing)			
		In storage	[°C]	-20 to +65 (non-freezing)			
			[°F]	-4 to +149 (non-freezing)			
	Ambient humidity	In operation	90%RH or less (non-condensing)				
		In storage					
	Ambient	Indoors (no direct sunlight) Free from corrosive gas, flammable gas, oil mist, dust and dirt					
	Altitude	Max. 1000m (3280ft) above sea level					
Vibration	5.9 [m/s ²] or less						
	19.4 [ft/s ²] or less						
Mass		[kg]	47				
		[lb]	103.617				
Function		Refer to the corresponding Servo Amplifier Instruction Manual of 22kW or less.					

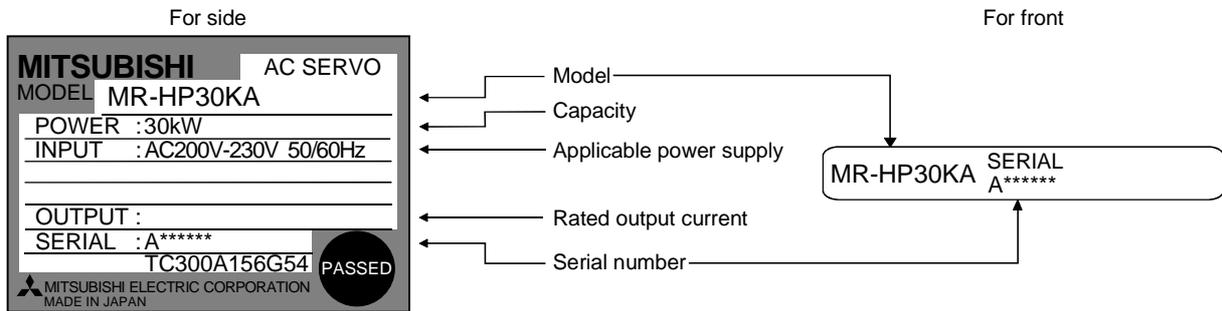
(2) 400V class

Item		Servo amplifier		MR-J2S-30KA4/B4 MR-H30KAN4/BN4	MR-J2S-37KA4/B4 MR-H37KAN4/BN4	MR-J2S-45KA4/B4 MR-H45KAN4/BN4	MR-J2S-55KA4/B4 MR-H55KAN4/BN4
Control power supply	Voltage/frequency	Single-phase 380 to 480VAC, 50/60Hz					
	Permissible voltage fluctuation	Single-phase 323 to 528VAC, 50/60Hz					
	Permissible frequency fluctuation	Within $\pm 5\%$					
	Power consumption	50W					
Main circuit power supply		The main circuit power of the servo amplifier is supplied by the converter unit.					
System		Sine-wave PWM control, current control system					
Structure		Open (IP00)					
Environment	Ambient temperature	During operation	[°C]	0 to +55 (non-freezing)			
			[°F]	32 to +131 (non-freezing)			
		In storage	[°C]	-20 to +65 (non-freezing)			
			[°F]	-4 to +149 (non-freezing)			
	Ambient humidity	In operation	90%RH or less (non-condensing)				
		In storage					
	Ambient	Indoors (no direct sunlight) Free from corrosive gas, flammable gas, oil mist, dust and dirt					
	Altitude	Max. 1000m (3280ft) above sea level					
Vibration	5.9 [m/s ²] or less						
	19.4 [ft/s ²] or less						
Mass		[kg]	36	47	47	47	
		[lb]	79.37	103.617	103.617	103.617	
Function		Refer to the corresponding Servo Amplifier Instruction Manual of 22kW or less.					

1. FUNCTIONS AND STRUCTURE

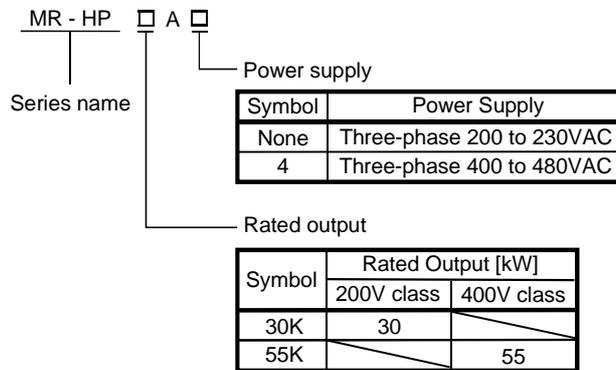
1.5 Model definition

1.5.1 Rating plate



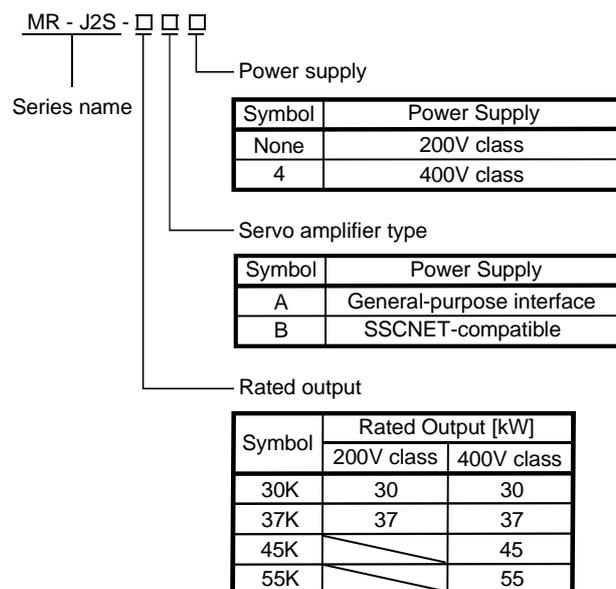
1.5.2 Model

(1) Converter unit



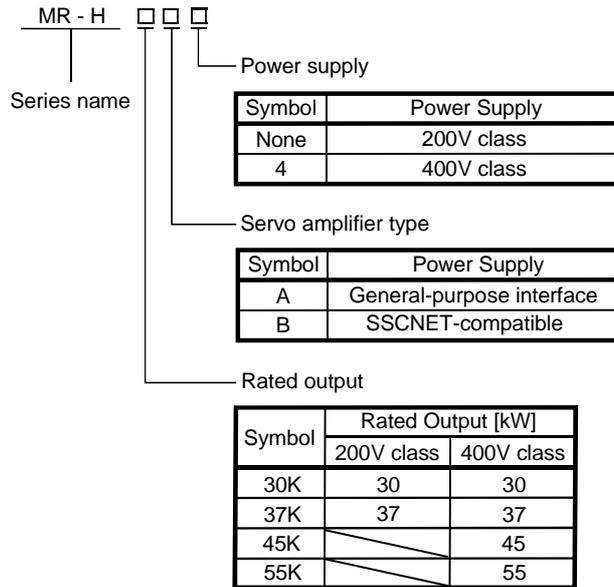
(2) Servo Amplifier

(a) MELSERVO-J2-Super series



1. FUNCTIONS AND STRUCTURE

(b) MELSERVO-H series



1.6 Combinations of converter units, servo amplifiers and servo motors

The following tables indicate the combinations of the converter units, servo amplifiers and servo motors. These servo motors may not be connected depending on the production time of the servo amplifier. Please refer to app1.

(1) 200V class

Converter unit	Servo Amplifier	Servo motor					
		HA-LFS□			HA-LF□		
		1000r/min	1500r/min	2000r/min	(Note) 1000r/min	(Note) 1500r/min	2000r/min
MR-HP30KA	MR-J2S-30KA/B	30K1	30K1M	30K2			
	MR-J2S-37KA/B	(Note) 37K1	(Note) 37K1M	37K2			
	MR-H30KAN/BN				30K1	30K1M	30K2
	MR-H37KAN/BN				37K1	37K1M	37K2

(2) 400V class

Converter unit	Servo Amplifier	Servo motor					
		HA-LFS□			HA-LF□		
		1000r/min	1500r/min	2000r/min	(Note) 1000r/min	(Note) 1500r/min	2000r/min
MR-HP55KA4	MR-J2S-30KA4/B4	(Note) 25K14 30K14	30K1M4	30K24			
	MR-J2S-37KA4/B4	(Note) 37K14	37K1M4	37K24			
	MR-J2S-45KA4/B4		45K1M4	45K24			
	MR-J2S-55KA4/B4		50K1M4	55K24			
	MR-H30KAN4/BN4				30K14	30K1M4	30K24
	MR-H37KAN4/BN4				37K14	37K1M4	37K24
	MR-H45KAN4/BN4					45K1M4	45K24
	MR-H55KAN4/BN4					50K1M4	55K24

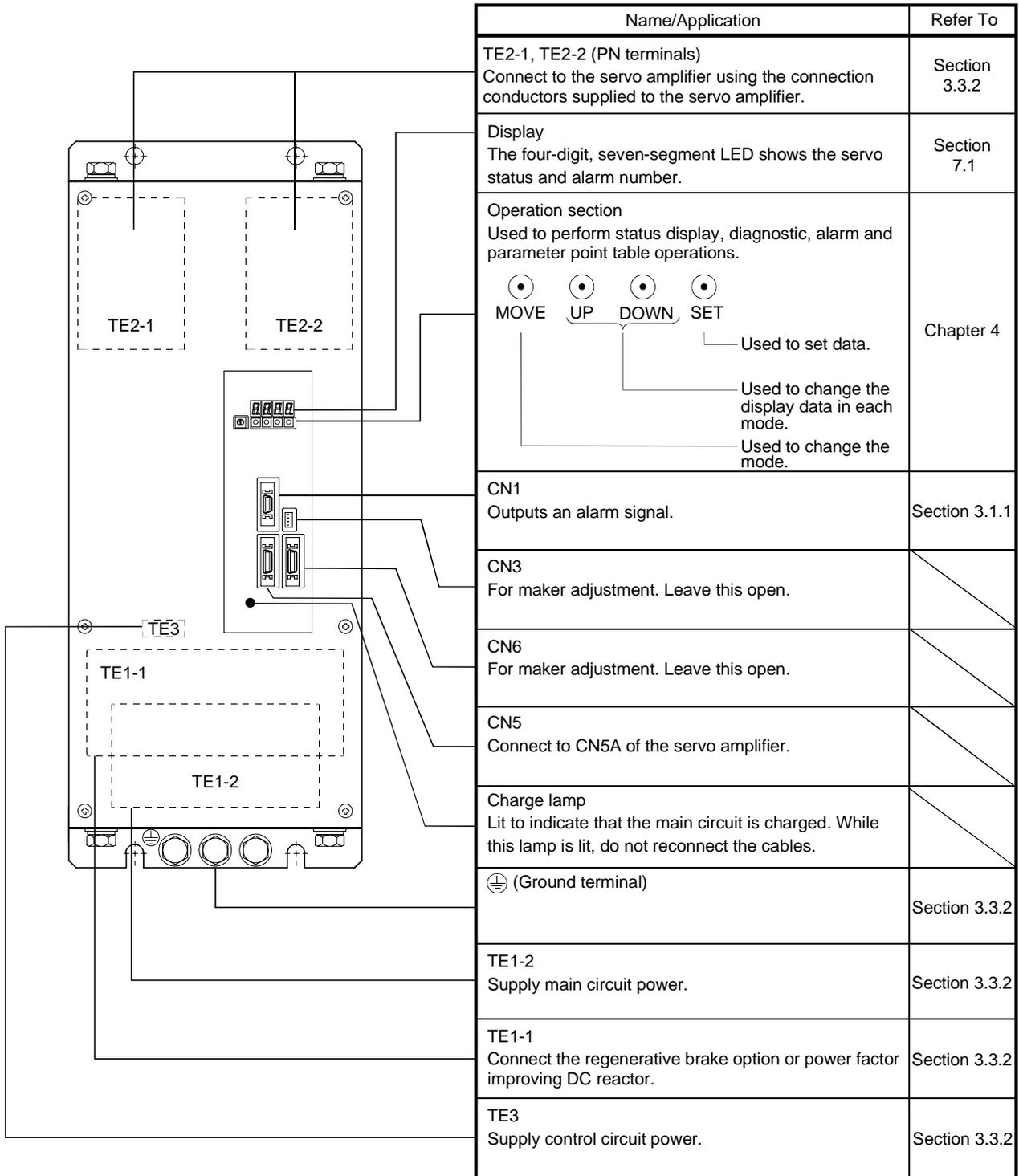
Note. Consult us since the servo amplifier to be used with any of these servo motors is optional.

1. FUNCTIONS AND STRUCTURE

1.7 Parts identification

The rating plate is on the right side face when viewed from the front.

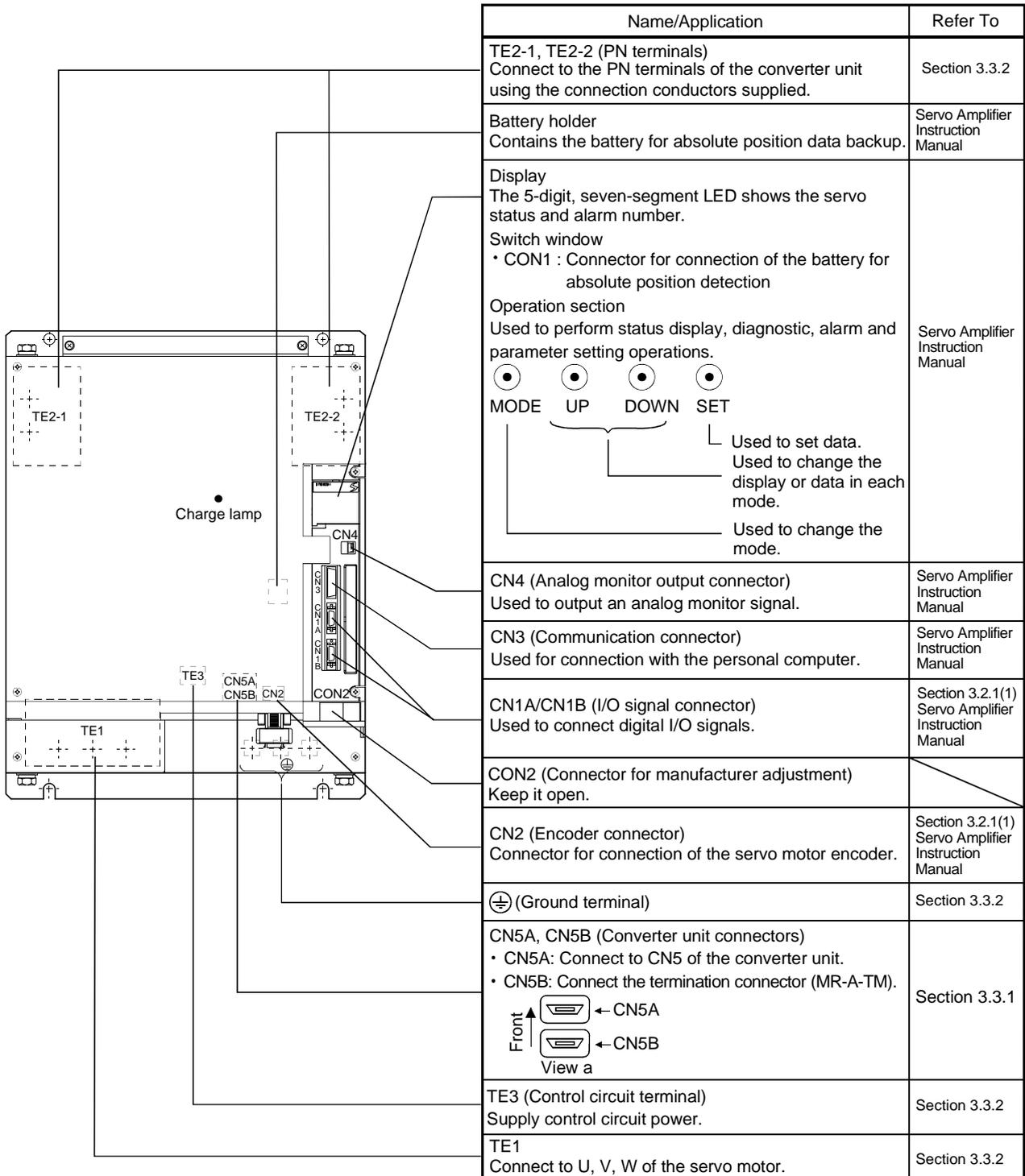
1.7.1 Converter unit (MR-HP-30KA/MR-HP55KA4)



1. FUNCTIONS AND STRUCTURE

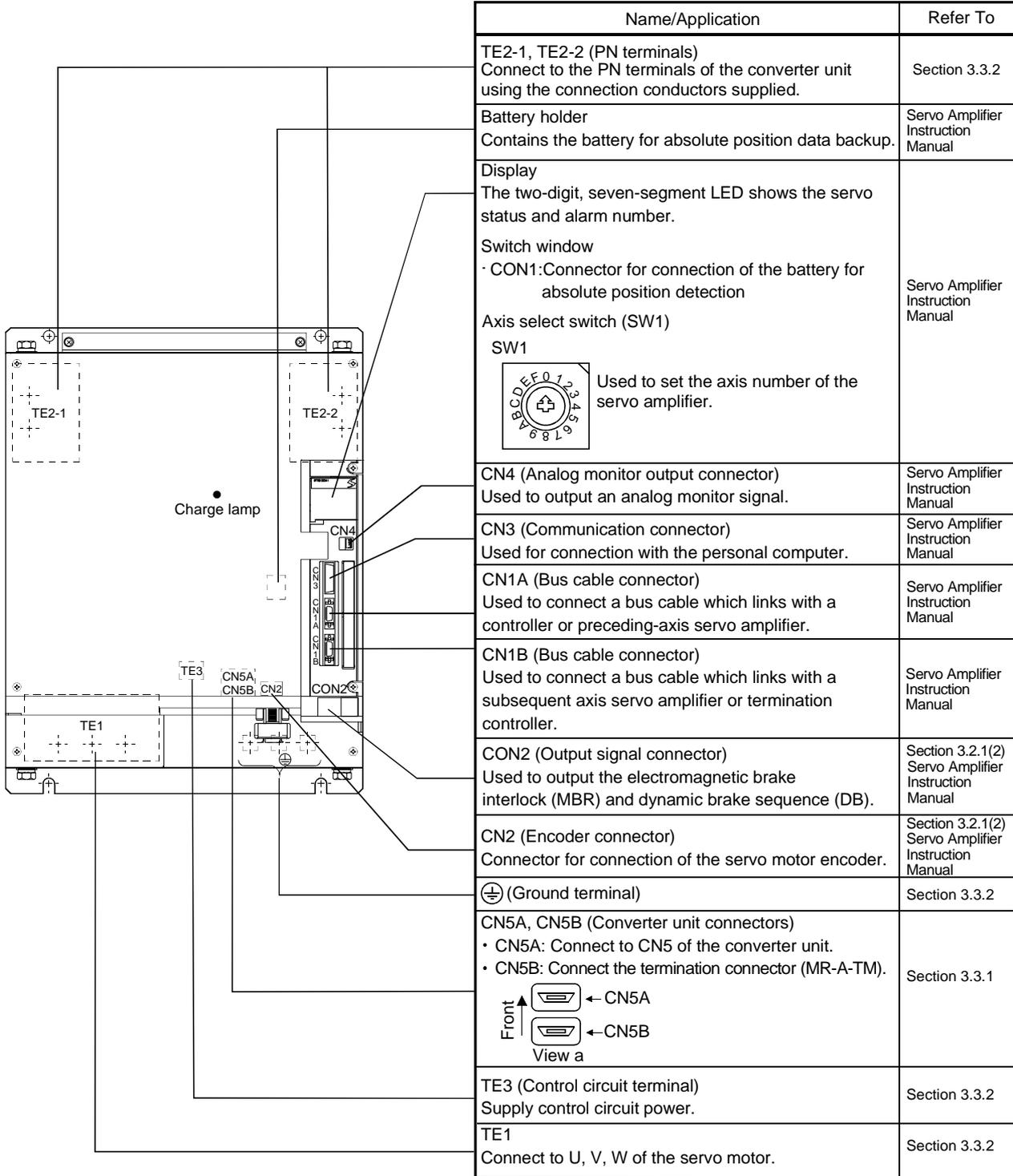
1.7.2 Servo amplifier

(1) MR-J2S-□A/A4



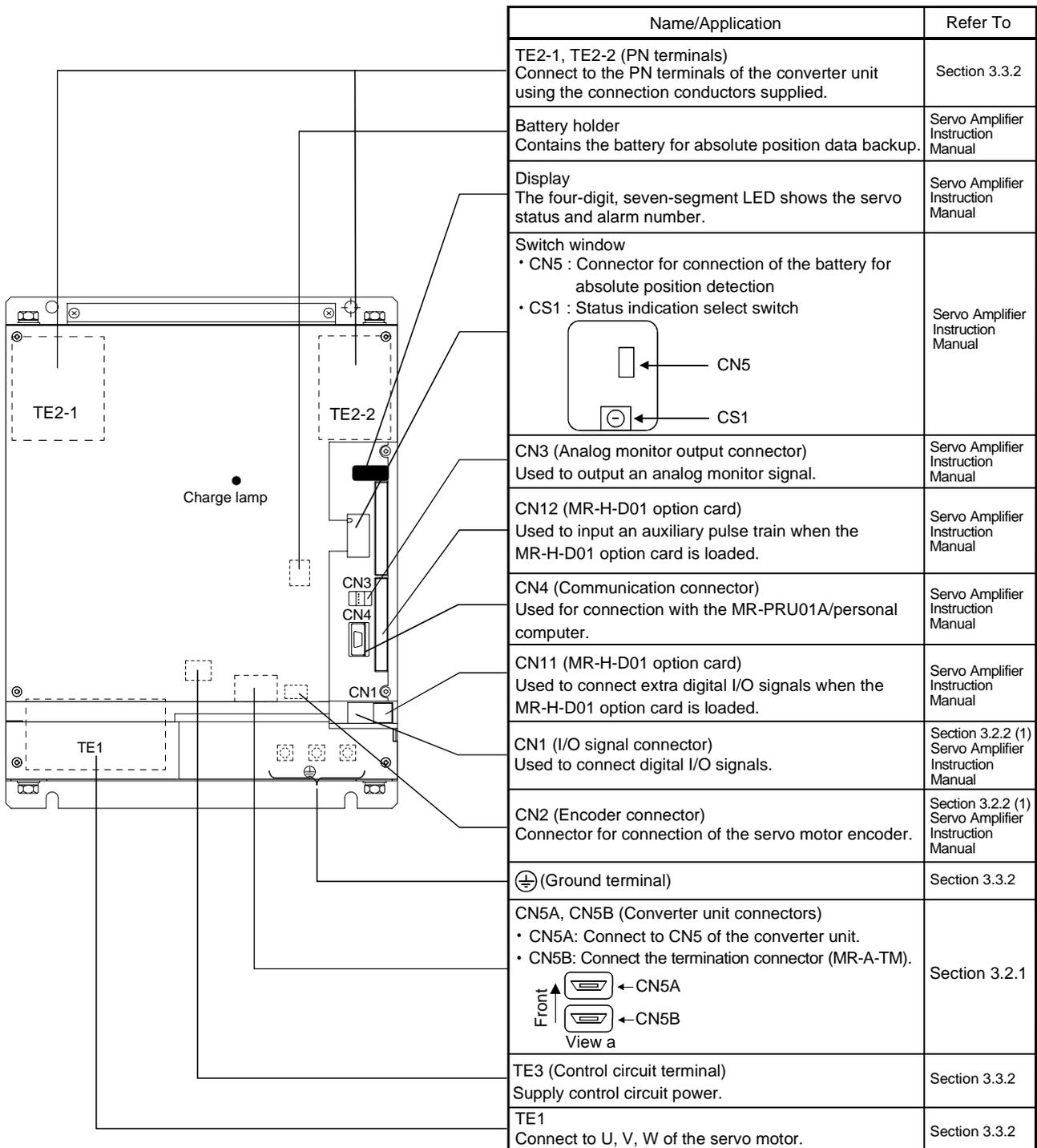
1. FUNCTIONS AND STRUCTURE

(2) MR-J2S-□B/B4



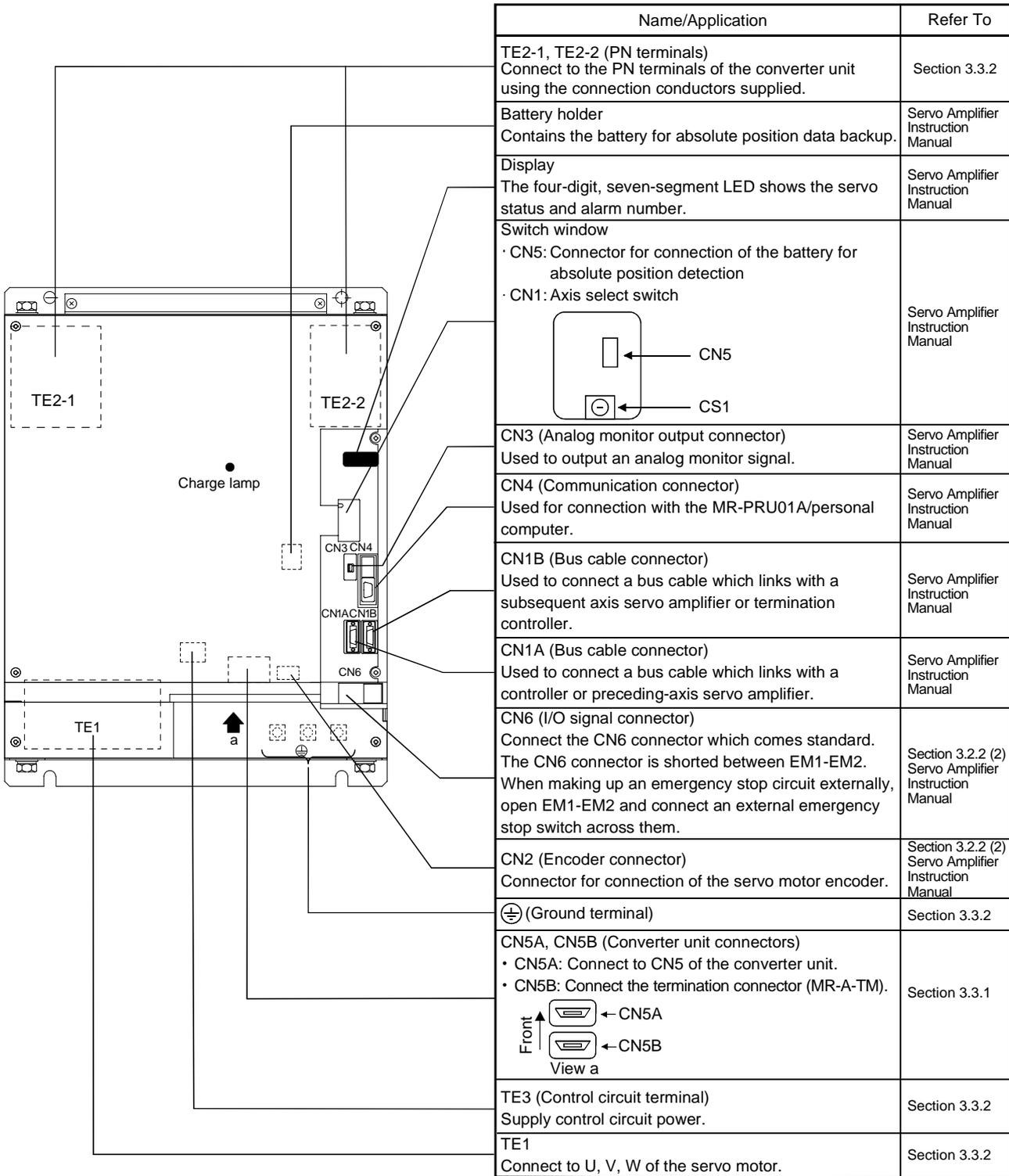
1. FUNCTIONS AND STRUCTURE

(3) MR-H□AN/AN4



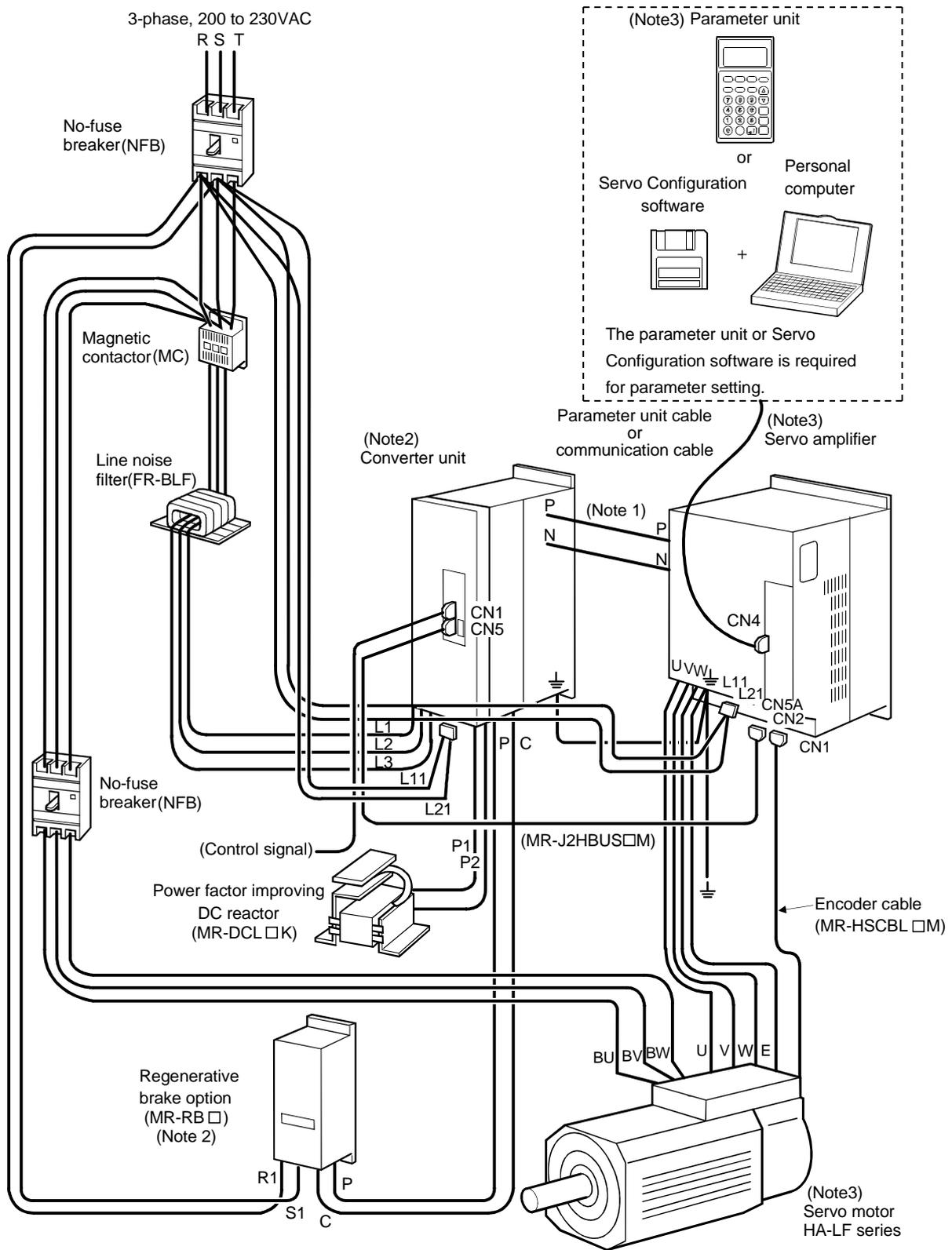
1. FUNCTIONS AND STRUCTURE

(4) MR-H□BN/BN4



1. FUNCTIONS AND STRUCTURE

1.8 Servo system with auxiliary equipment



Note 1. The P-N conductor bar for connection of converter unit and servo amplifier is a standard accessory.

2. This system requires the converter unit.

3. For the MELSERVO-H series.

2. INSTALLATION

2. INSTALLATION



CAUTION

- Stacking in excess of the limited number of products is not allowed.
- Install the equipment to incombustibles. Installing them directly or close to combustibles will led to a fire.
- Install the equipment in a load-bearing place in accordance with this Instruction Manual.
- Do not get on or put heavy load on the equipment to prevent injury.
- Use the equipment within the specified environmental condition range.
- Provide an adequate protection to prevent screws, metallic detritus and other conductive matter or oil and other combustible matter from entering the Converter unit and servo amplifier.
- Do not block the intake/exhaust ports of the Converter unit and servo amplifier. Otherwise, a fault may occur.
- Do not subject the Converter unit and servo amplifier to drop impact or shock loads as they are precision equipment.
- Do not install or operate a faulty Converter unit and servo amplifier.
- When the product has been stored for an extended period of time, consult Mitsubishi.

2.1 Environmental conditions

Environment		Conditions	
Ambient temperature	Operation	[°C]	0 to +55 (non-freezing)
		[°F]	32 to +131 (non-freezing)
	Storage	[°C]	-20 to +65 (non-freezing)
		[°F]	-4 to +149 (non-freezing)
Ambient humidity	Operation	90%RH or less (non-condensing)	
	Storage		
Ambient		Indoors (no direct sunlight) Free from corrosive gas, flammable gas, oil mist, dust and dirt	
Altitude		Max. 1000m (3280 ft) above sea level	
Vibration		5.9 [m/s ²] or less	
		19.4 [ft/s ²] or less	

2. INSTALLATION

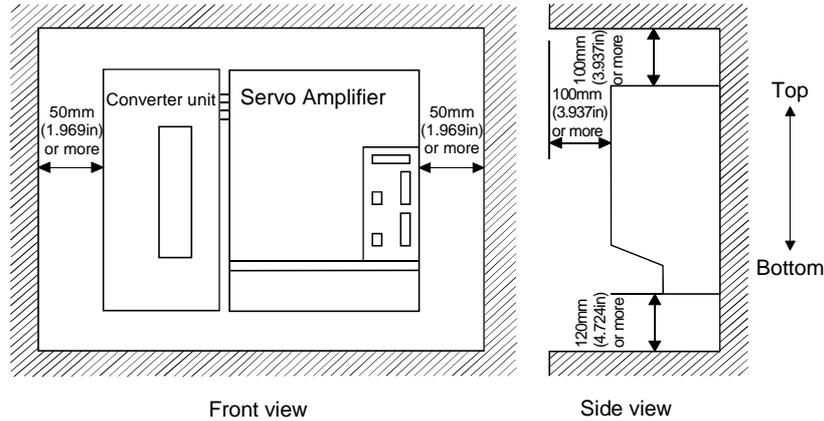
2.2 Installation direction and clearances



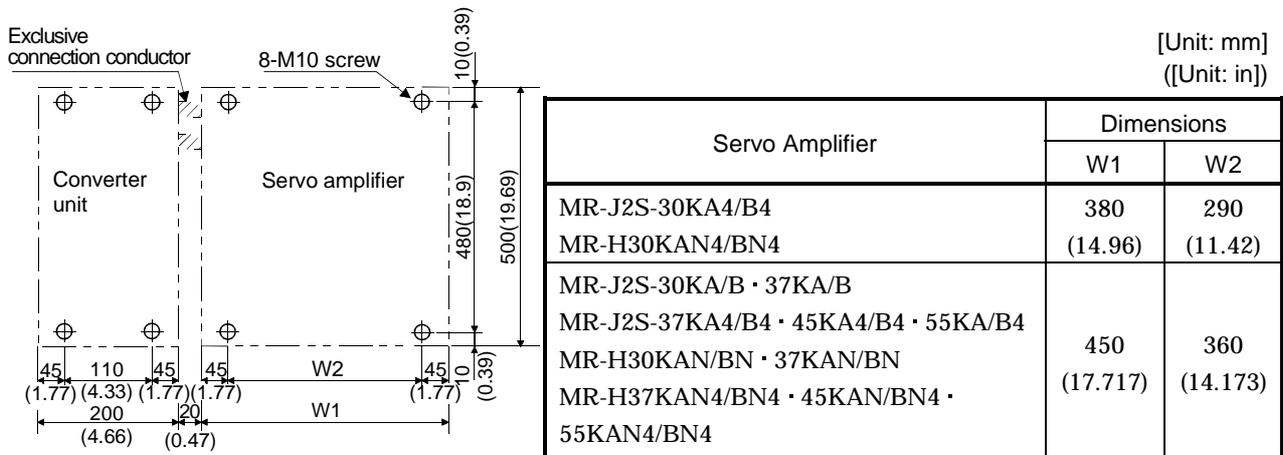
CAUTION

- Install the equipment in the specified direction. Not doing so can cause a failure.
- Leave the specified clearances between the converter unit/servo amplifier and the control box inside walls or other equipment. Not doing so can cause a failure.

(1) Installation of one servo amplifier



(2) Mounting dimensional diagram



(3) Others

When using heat generating equipment such as the regenerative brake option, install them with full consideration of heat generation so that the Converter unit and servo amplifier is not affected.

Install the Converter unit and servo amplifier on a perpendicular wall in the correct vertical direction.

3. SIGNALS AND WIRING

3. SIGNALS AND WIRING



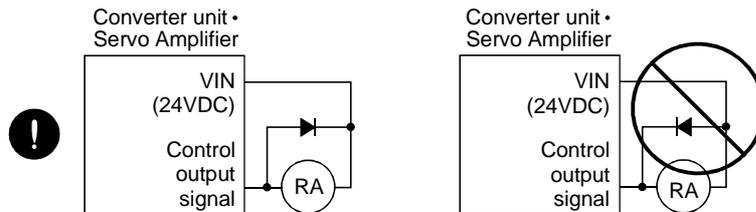
WARNING

- Any person who is involved in wiring should be fully competent to do the work.
- Before starting wiring, make sure that the charge lamp is off and the voltage is safe in the tester or the like more than 20 minutes after power-off. Otherwise, you may get an electric shock.
- Ground the Converter unit and servo amplifier and the servo motor securely.
- Do not attempt to wire the Converter unit and servo amplifier and servo motor until they have been installed. Otherwise, you may get an electric shock.
- The cables should not be damaged, stressed excessively, loaded heavily, or pinched. Otherwise, you may get an electric shock.



CAUTION

- Wire the equipment correctly and securely. Otherwise, the servo motor may misoperate resulting in injury.
- Connect cables to correct terminals to prevent a burst, fault, etc.
- Ensure that polarity (+, -) is correct. Otherwise, a burst, damage, etc. may occur.
- The surge absorbing diode installed to the DC relay designed for control output should be fitted in the specified direction. Otherwise, the signal is not output due to a fault, disabling the emergency stop and other protective circuits.



- Use a noise filter, etc. to minimize the influence of electromagnetic interference, which may be given to electronic equipment used near the Converter unit and servo amplifier.
- Do not install a power capacitor, surge suppressor or radio noise filter (FR-BIF option) with the power line of the servo motor.
- When using the regenerative brake resistor, switch power off with the alarm signal. Otherwise, a transistor fault or the like may overheat the regenerative brake resistor, causing a fire.
- Do not modify the equipment.

POINT

- The pin with the same signal name are connected in the servo amplifier.

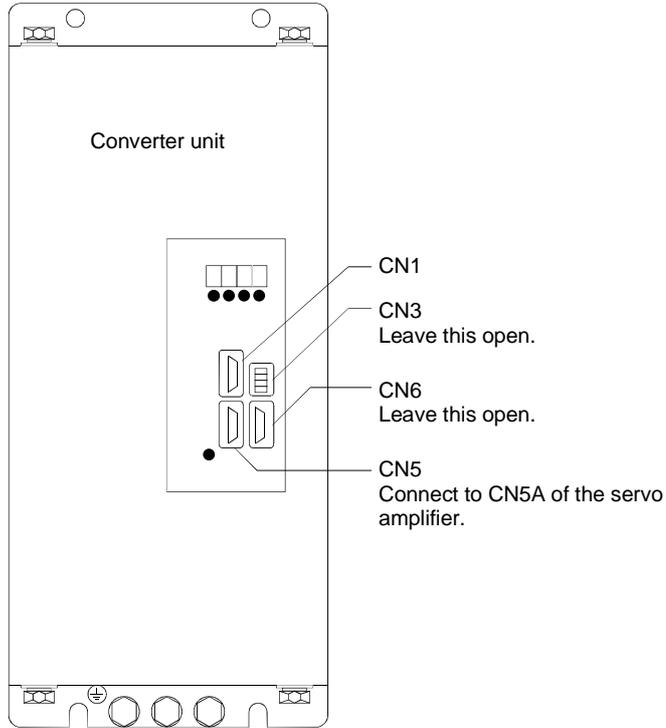
3. SIGNALS AND WIRING

3.1 I/O Signals of Converter Unit (MR-HP30KA/MR-HP55KA4)

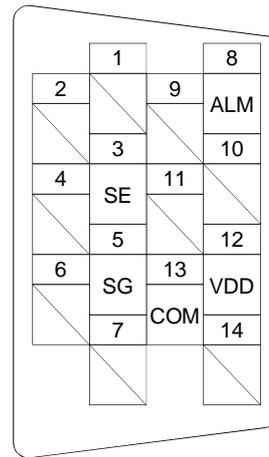
POINT

- The signal layouts of the connectors are views from the wiring section of the cable connectors.

(1) Connectors and signal layouts



CN1 (alarm output connector)
Model: 10114-3000VE(3M make)



3. SIGNALS AND WIRING

(2) Explanation of signals

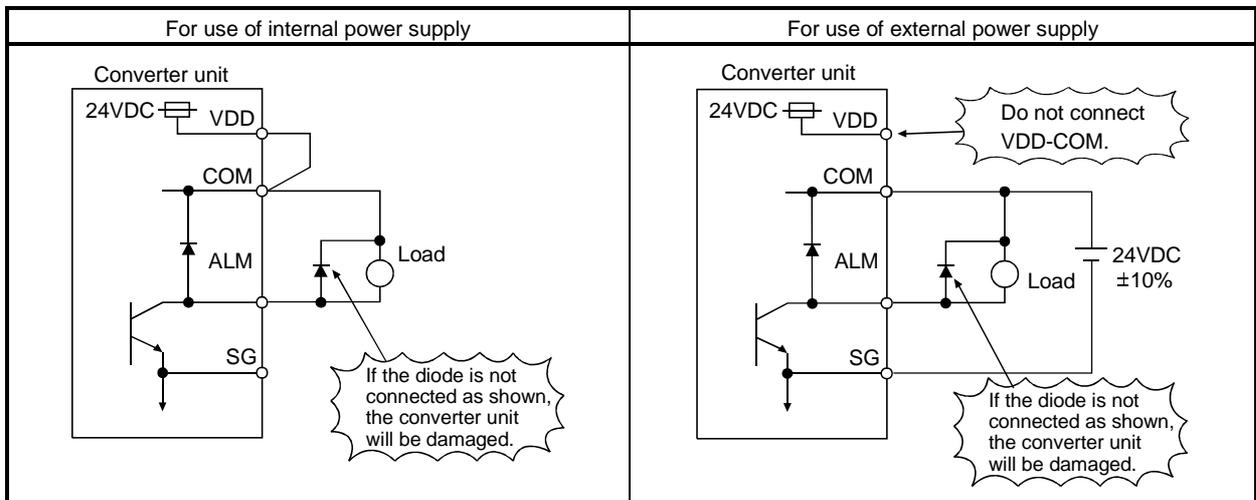
For the I/O interfaces (symbols in I/O column in the table), refer to this section(b)

(a) Signals

Signal Name	Pin Code	Pin No.	Function/Application	I/O Category
Driver power supply	VDD	12	+24V \pm 10% is output across VDD-SG. Connect with COM when using this power supply for the digital interface. Permissible current: 80mA	
Digital I/F power supply input	COM	13	Enter 24VDC \pm 10% for digital interface. Digital interface driver power supply input terminal. Connect to VDD when using VDD as an interface power supply. Connect a 24VDC, 80mA or more power supply here when using an external power supply.	
24V common	SG	5	Common terminal for VDD. Isolated from LG.	
Signal common	SE	3	Common for open collector output. Connect to SG.	
Shield	SD	Plate	Connect one end of the shield cable.	
Trouble	ALM	8	ALM-SG are disconnected when the protective circuit is activated to shut off the base circuit at power-off. They are connected when the status is normal at power-on.	DO-1

(b) Output interface (DO-1)

A lamp, relay or photocoupler can be driven. (Permissible current: 40mA or less, inrush current: 100mA or less)



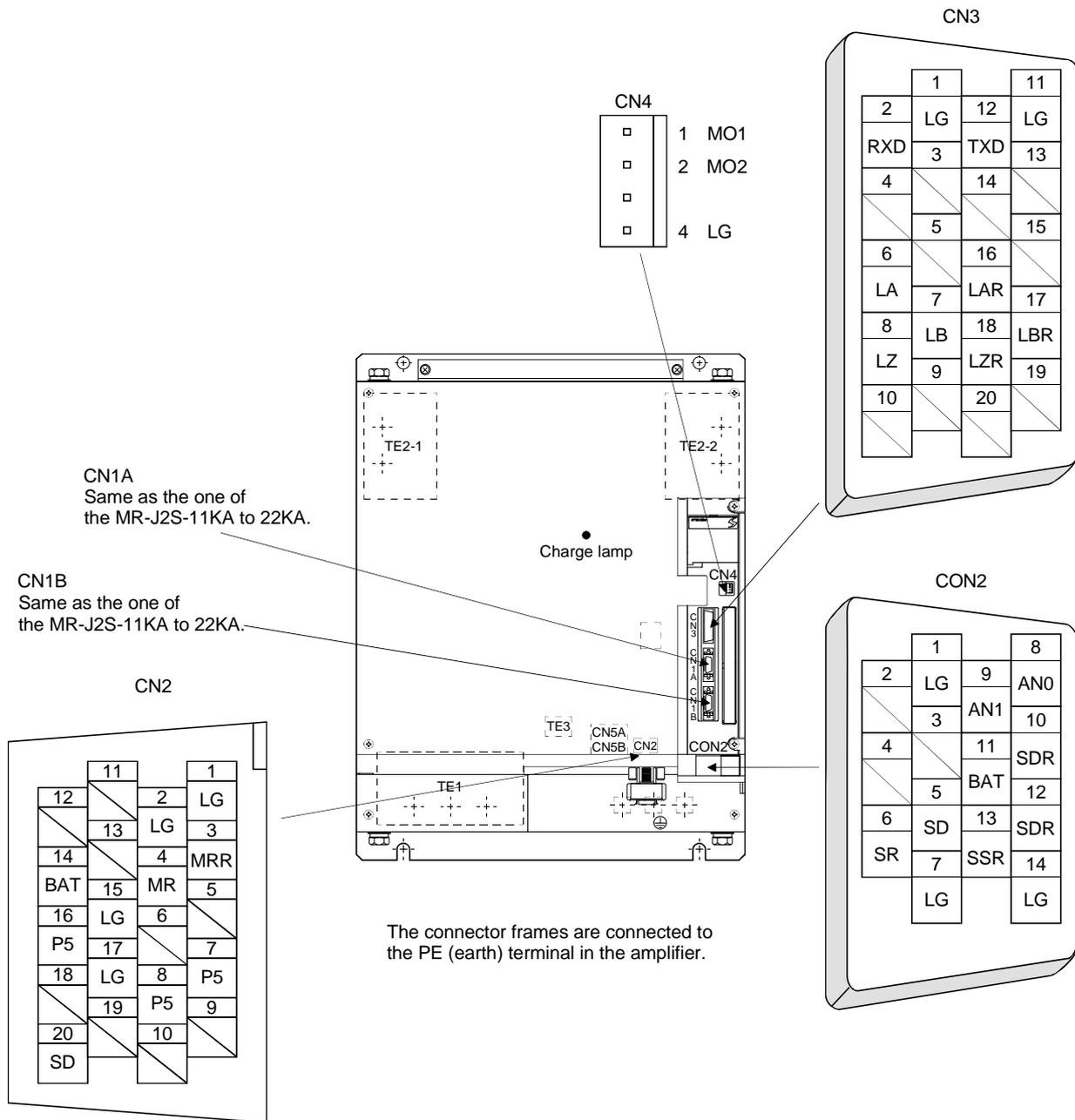
3. SIGNALS AND WIRING

3.2 Connectors and signal layouts of the servo amplifiers

POINT
<ul style="list-style-type: none"> ▪ The signals are the same as those of the 11k to 22kW servo amplifiers. Refer to the Signal chapter of the corresponding Servo Amplifier Instruction Manual. ▪ The pin layouts of the connectors are as seen from the connector wiring section of the cable.

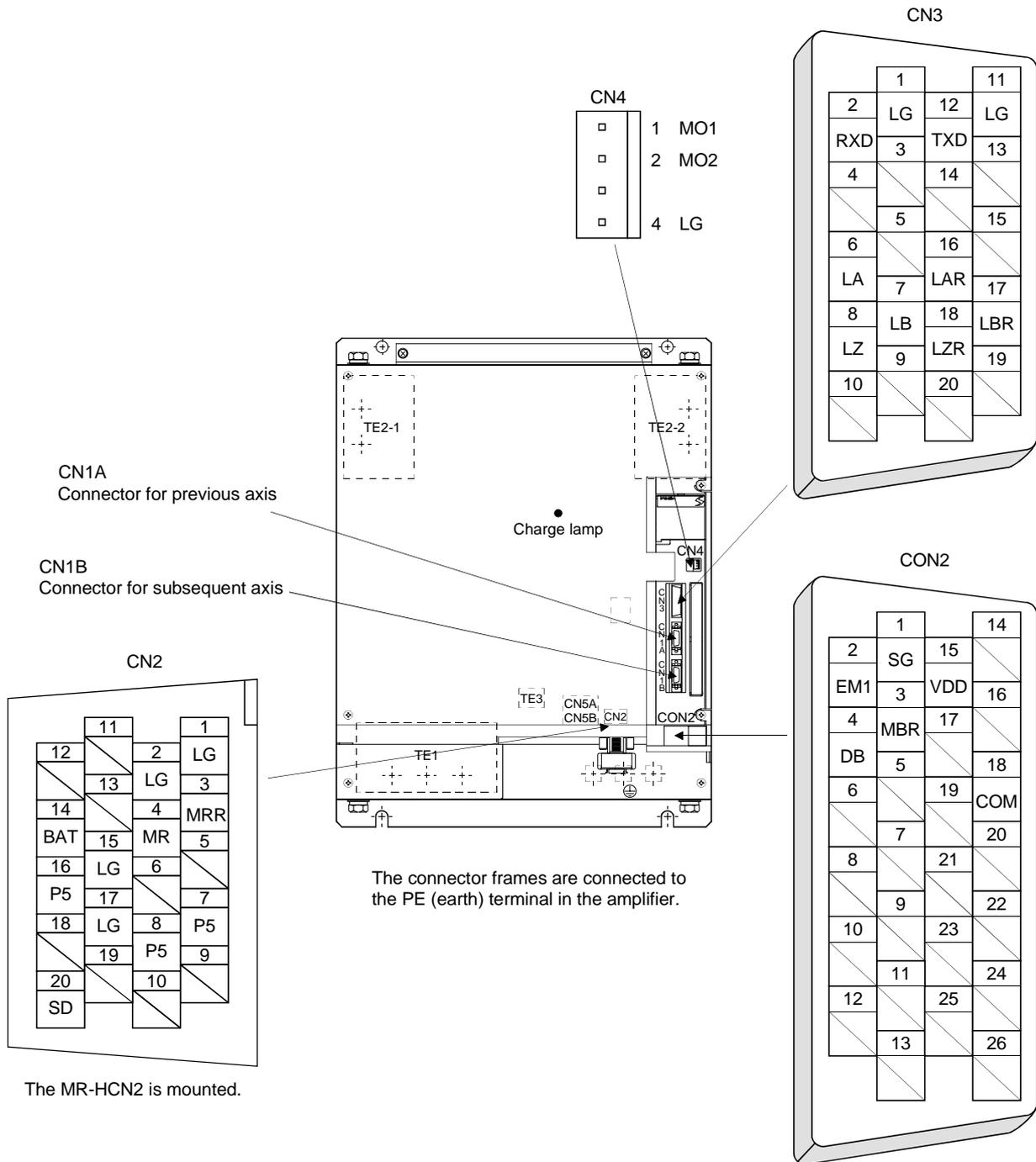
3.2.1 MELSERVO-J2-Super series

(1) MR-J2S-□A/A4



3. SIGNALS AND WIRING

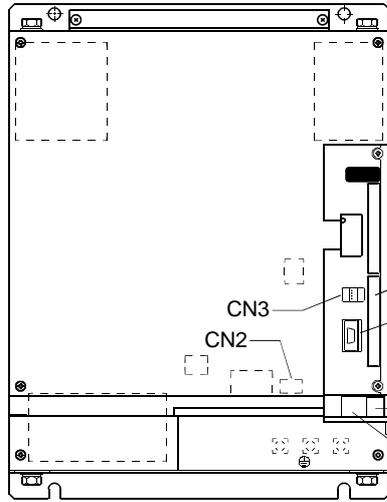
(2) MR-J2S-□□/B4



3. SIGNALS AND WIRING

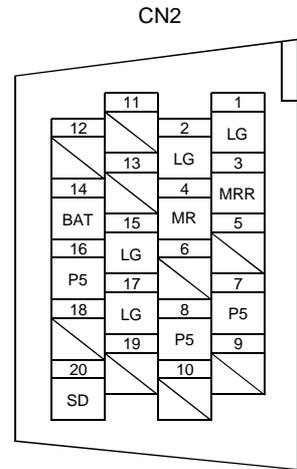
3.2.2 MELSERVO-H series

(1) MR-H□AN/AN4

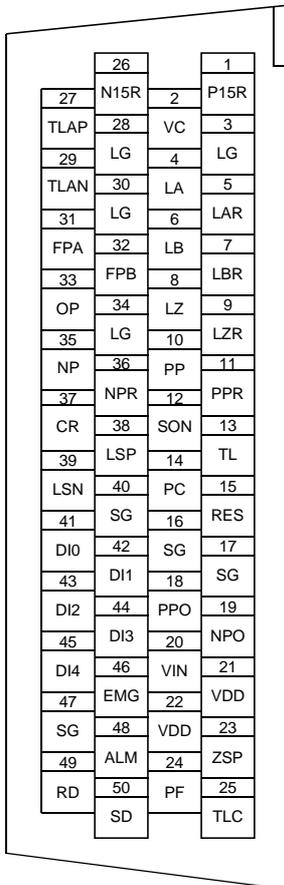


- (Note) CN12 (MR-H-D01)
- CN4 (For parameter unit)
- (Note) CN11 (MR-H-D01)
- CN1

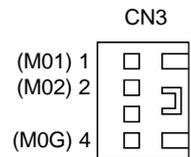
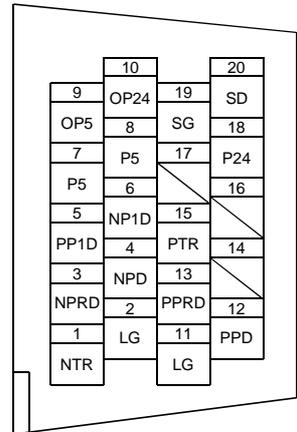
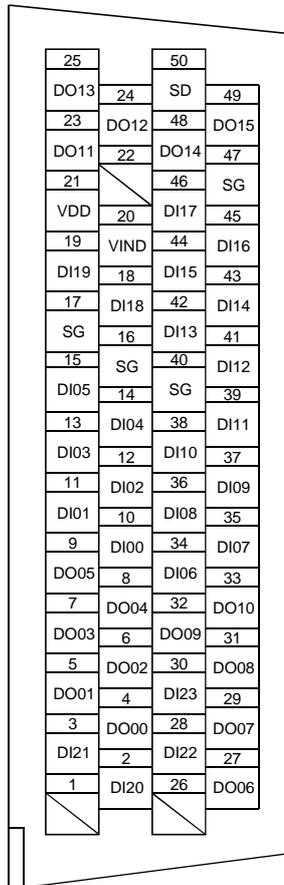
Note. Used when the MR-H-D01 option card is loaded.



CN1

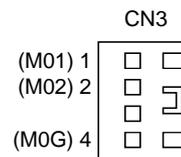
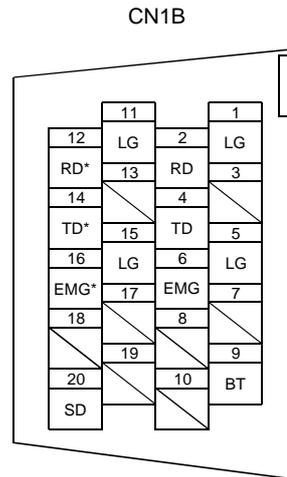
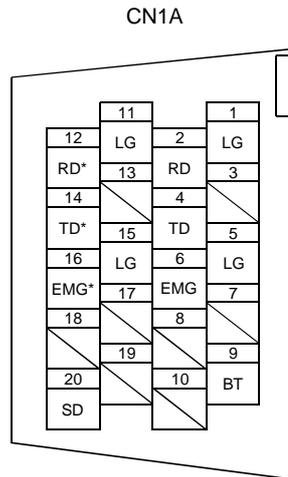
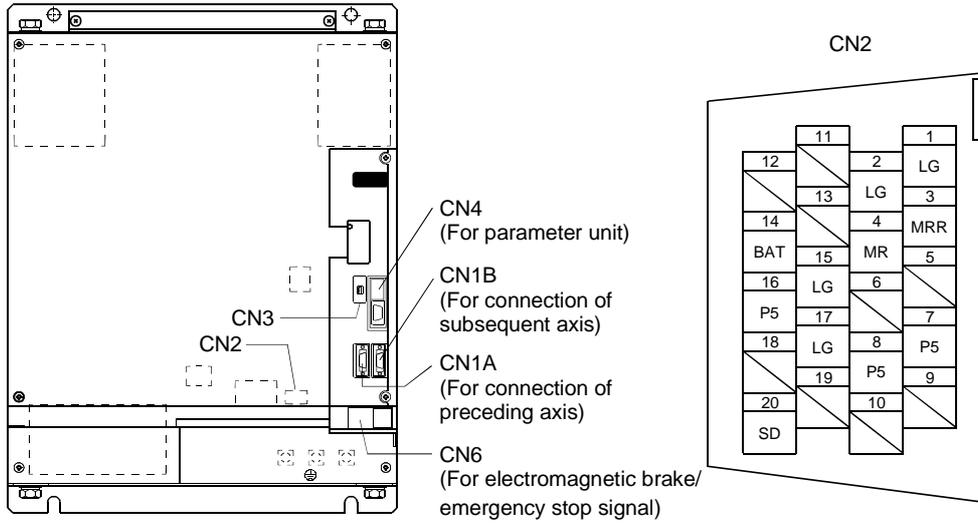


CN11



3. SIGNALS AND WIRING

(2) MR-H□BN/BN4



CN6 connector (EM1-EM2 shorted) supplied as standard

3. SIGNALS AND WIRING

3.3 Power line circuit



WARNING

- Insulate the connections of the power supply terminals. Not doing so can cause an electric shock.



CAUTION

- When the servo amplifier has become faulty, switch power off on the Converter unit power side. Continuous flow of a large current may cause a fire.
- Use the trouble signal to switch power off. Otherwise, a regenerative brake transistor fault or the like may overheat the regenerative brake resistor, causing a fire.
- Connect the power supply phases (U, V, W) of the servo amplifier and servo motor correctly. Not doing so can cause the servo motor to run abnormally.
- Do not connect a three-phase 200V power supply or a three-phase 400V power supply directly to the servo motor. Doing so can cause a failure.

3. SIGNALS AND WIRING

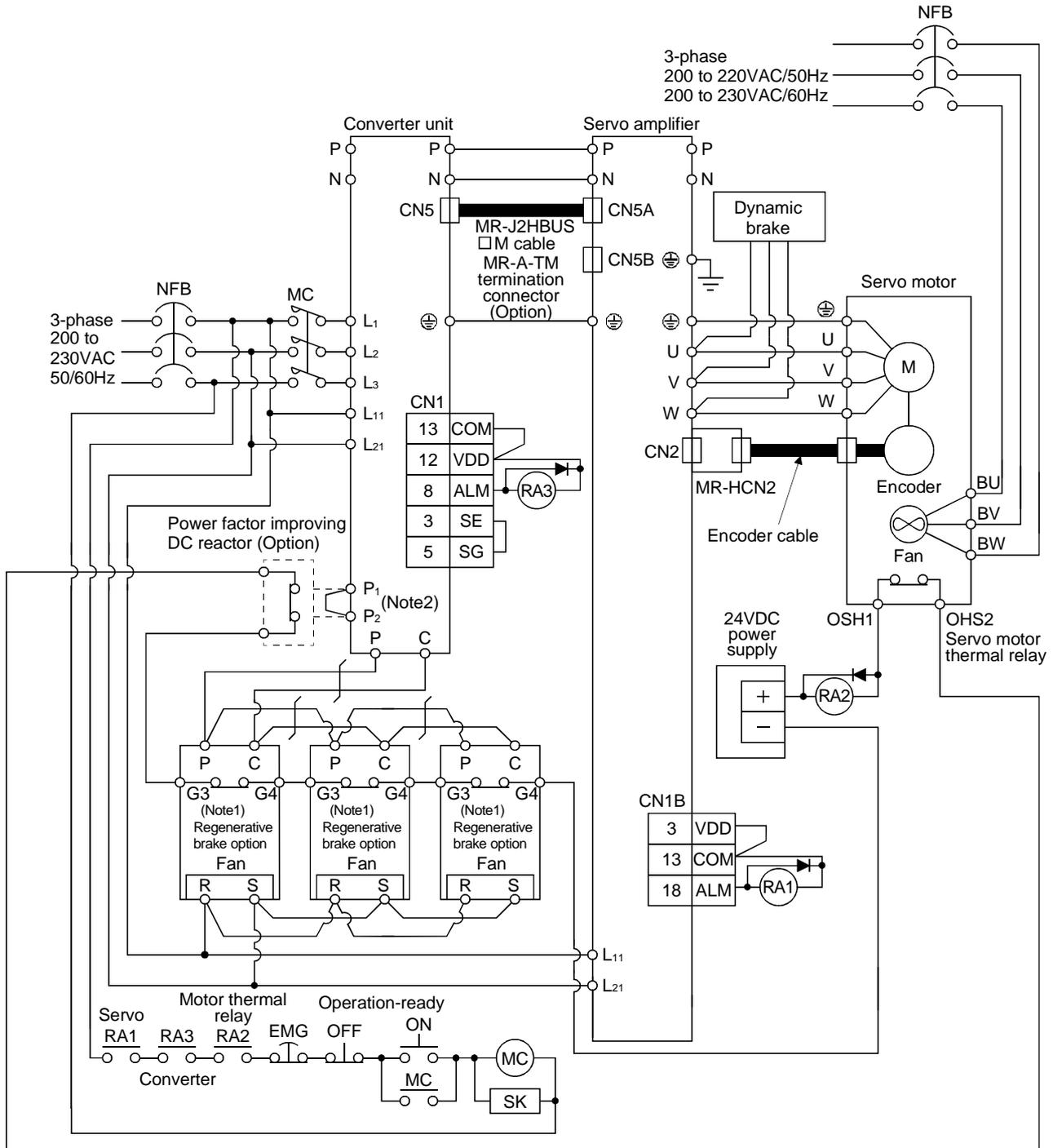
3.3.1 Connection example

(1) 200V class

POINT

▪ When using the external dynamic, Refer to Section 10.1.2.

(a) MR-J2S-□A

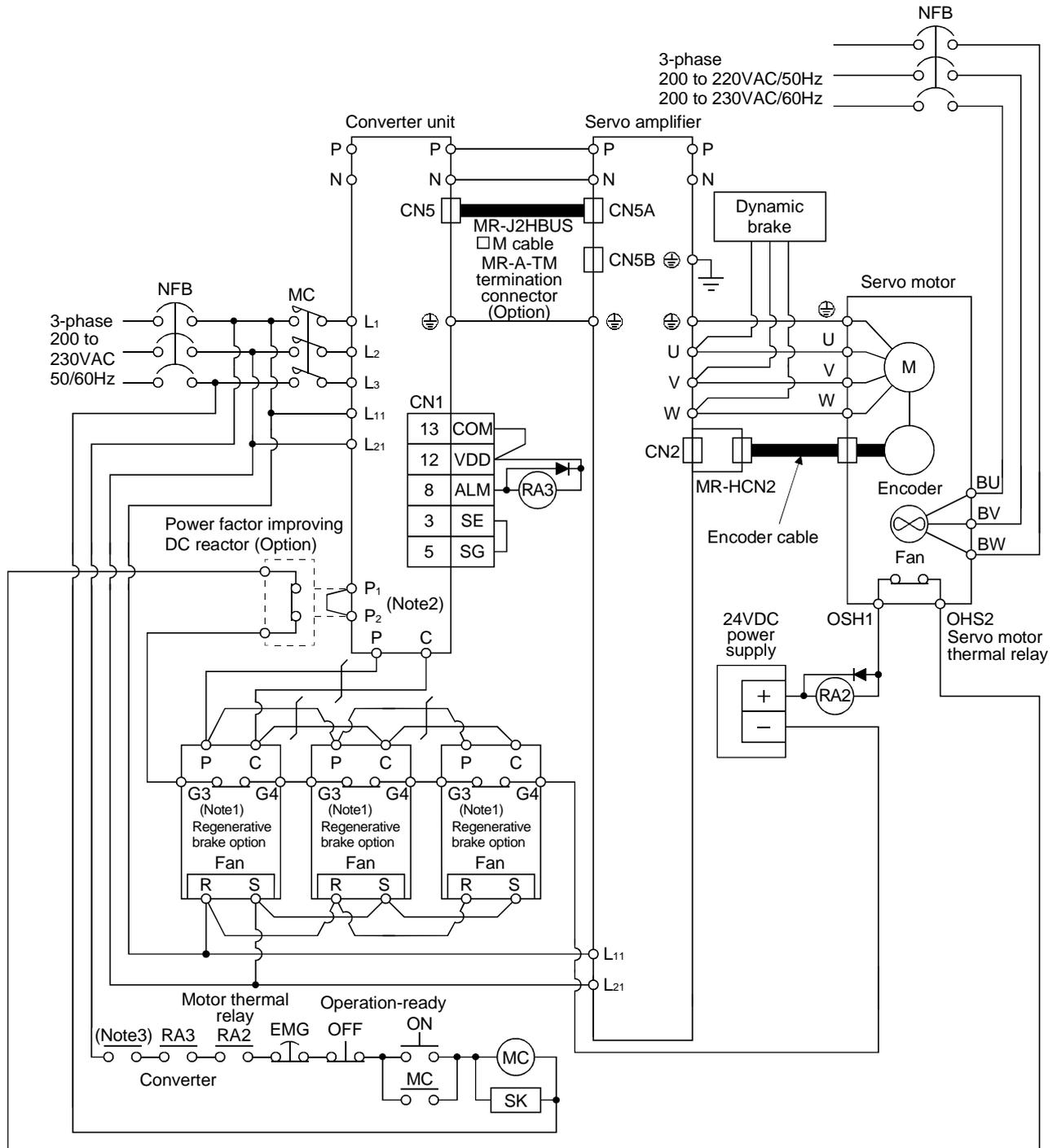


Note 1. For the MR-RB137. For the MR-RB137, three units are used as one set (permissible wattage: 3900W).

2. When using the Power factor improving DC reactor, disconnect the short bar across P1-P2.

3. SIGNALS AND WIRING

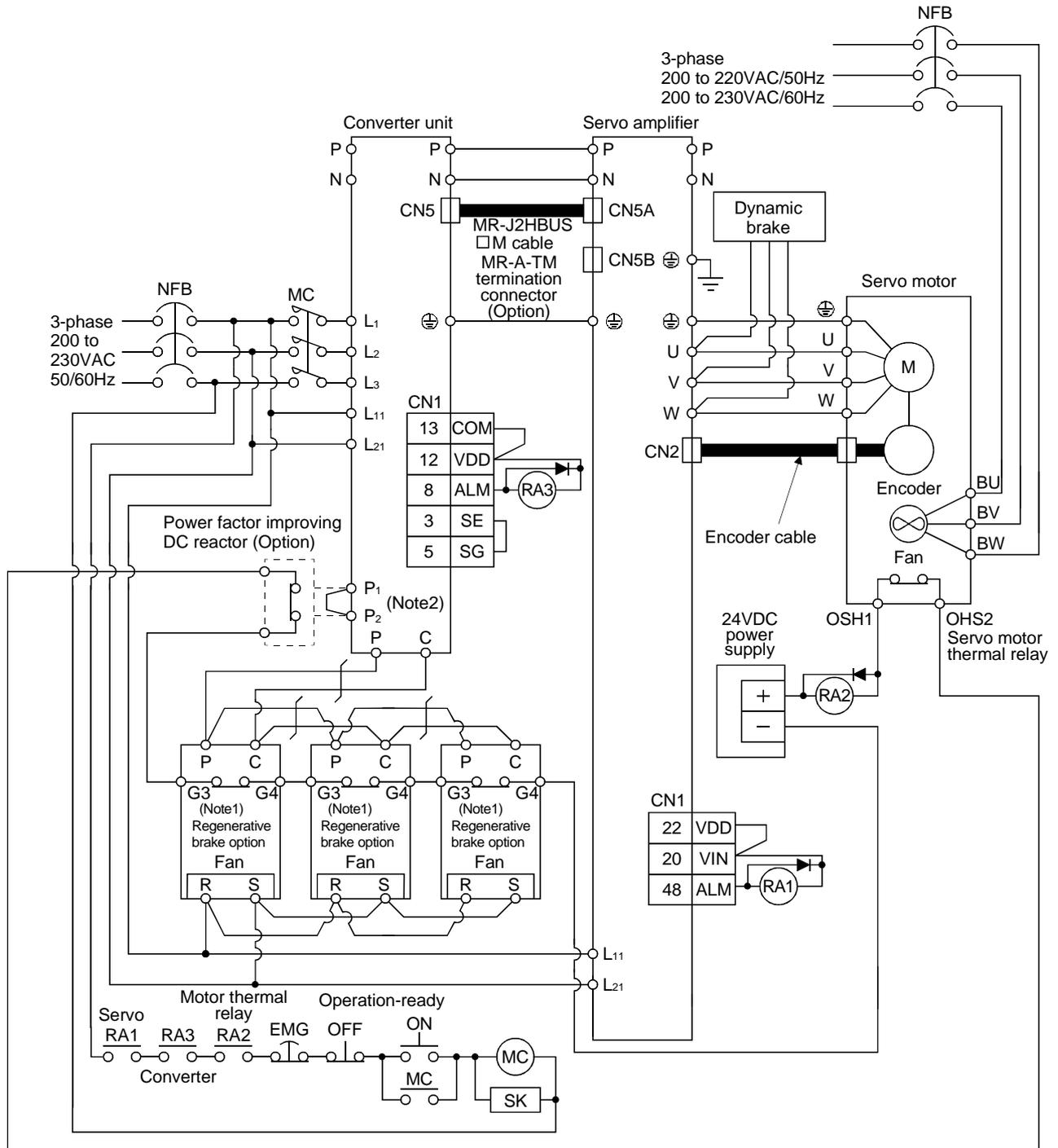
(b) MR-J2S-□B



- Note 1. For the MR-RB137. For the MR-RB137, three units are used as one set (permissible wattage: 3900W).
 2. When using the Power factor improving DC reactor, disconnect the short bar across P1-P2.
 3. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

3. SIGNALS AND WIRING

(c) MR-H□AN

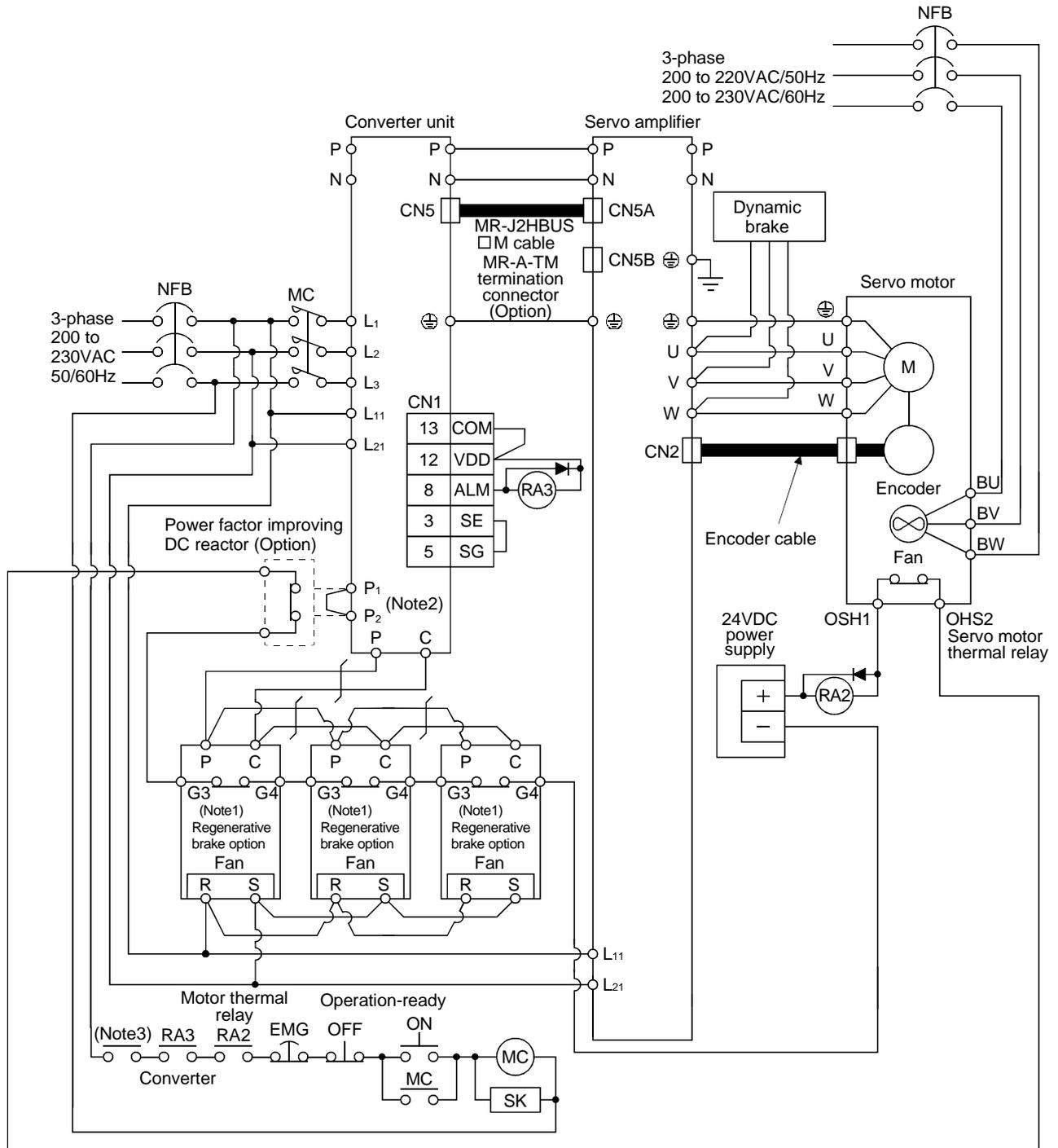


Note 1. For the MR-RB137. For the MR-RB137, three units are used as one set (permissible wattage: 3900W).

2. When using the Power factor improving DC reactor, disconnect the short bar across P1-P2.

3. SIGNALS AND WIRING

(d) MR-H□BN



Note 1. For the MR-RB137. For the MR-RB137, three units are used as one set (permissible wattage: 3900W).

2. When using the Power factor improving DC reactor, disconnect the short bar across P1-P2.

3. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

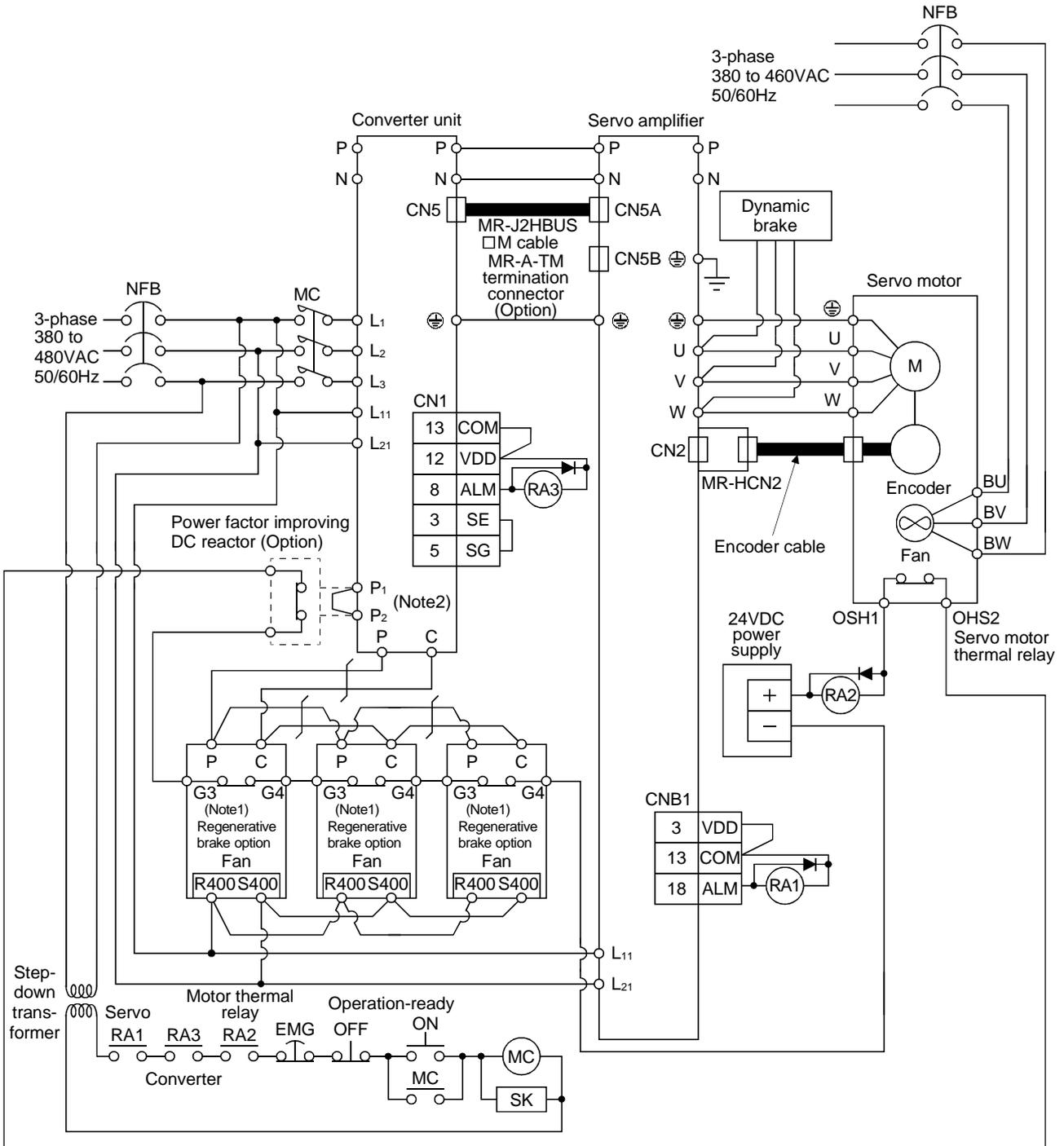
3. SIGNALS AND WIRING

(2) 400V class

POINT

▪ When using the external dynamic, Refer to Section 10.2.2.

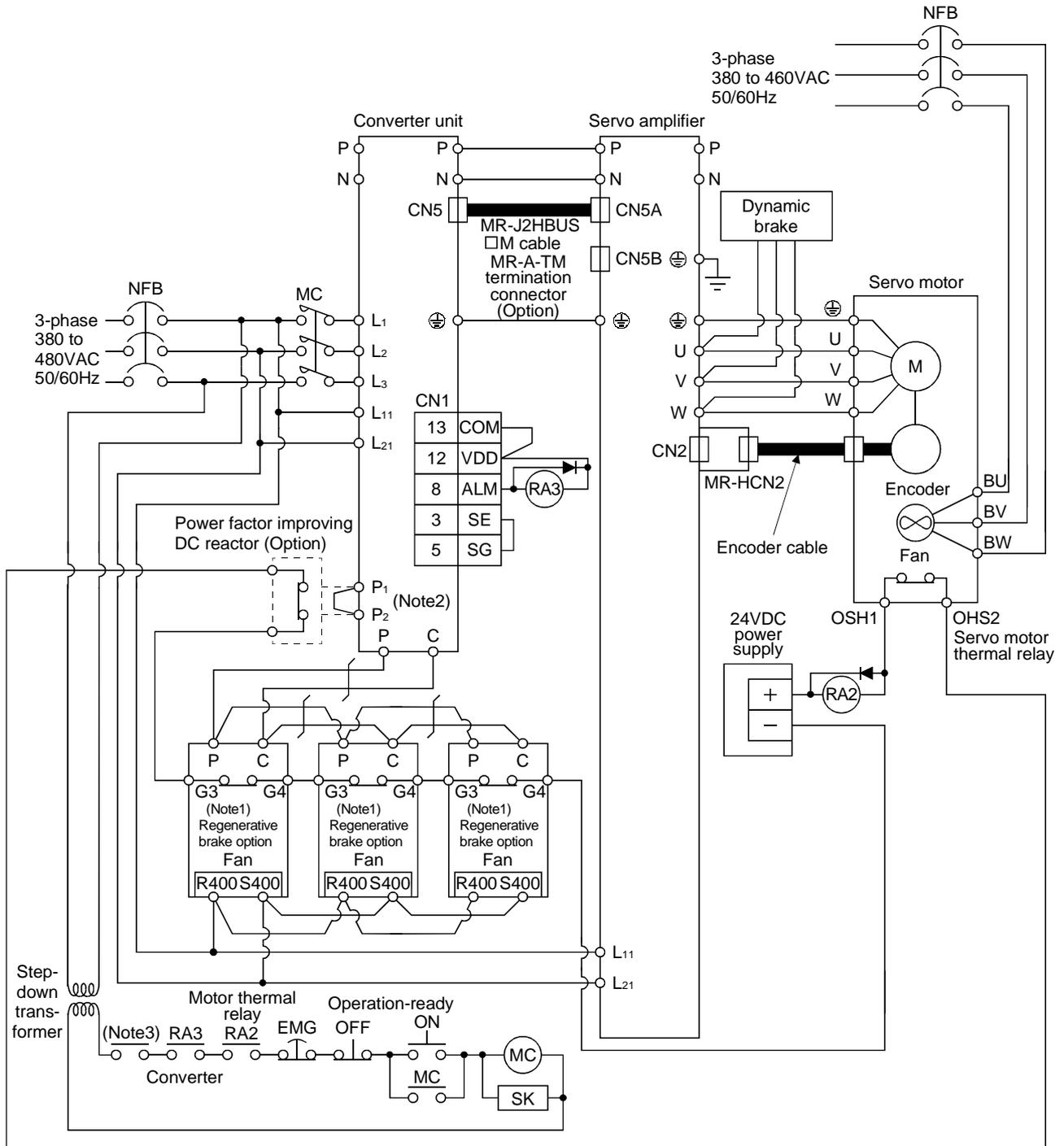
(a) MR-J2S-□A4



Note 1. For the MR-RB138-4. For the MR-RB138-4, three units are used as one set (permissible wattage: 3900W).
 2. When using the Power factor improving DC reactor, disconnect the short bar across P1-P2.

3. SIGNALS AND WIRING

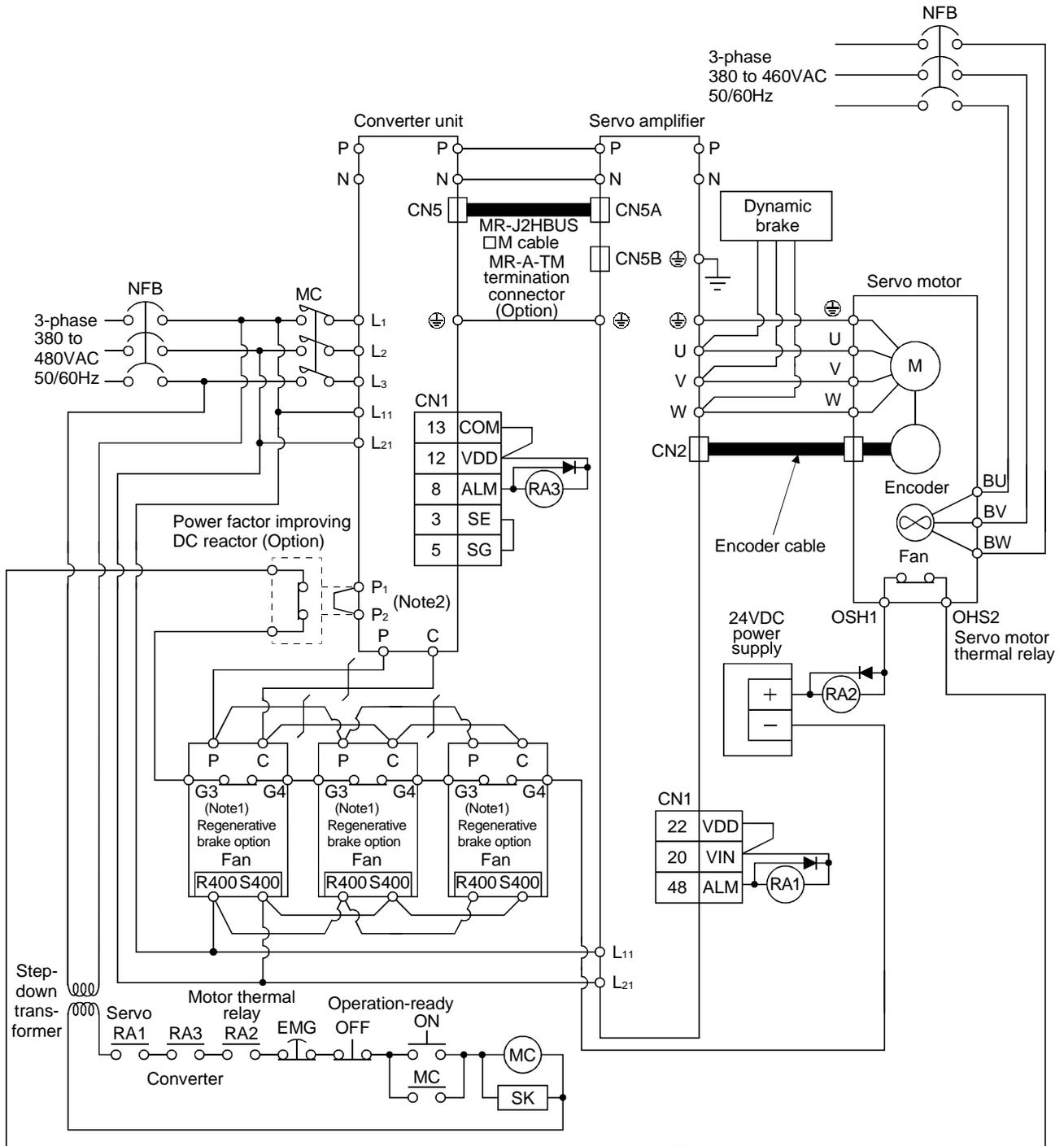
(b) MR-J2S-□B4



- Note 1. For the MR-RB138-4. For the MR-RB138-4, three units are used as one set (permissible wattage: 3900W).
 2. When using the Power factor improving DC reactor, disconnect the short bar across P1-P2.
 3. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

3. SIGNALS AND WIRING

(c) MR-H□AN4

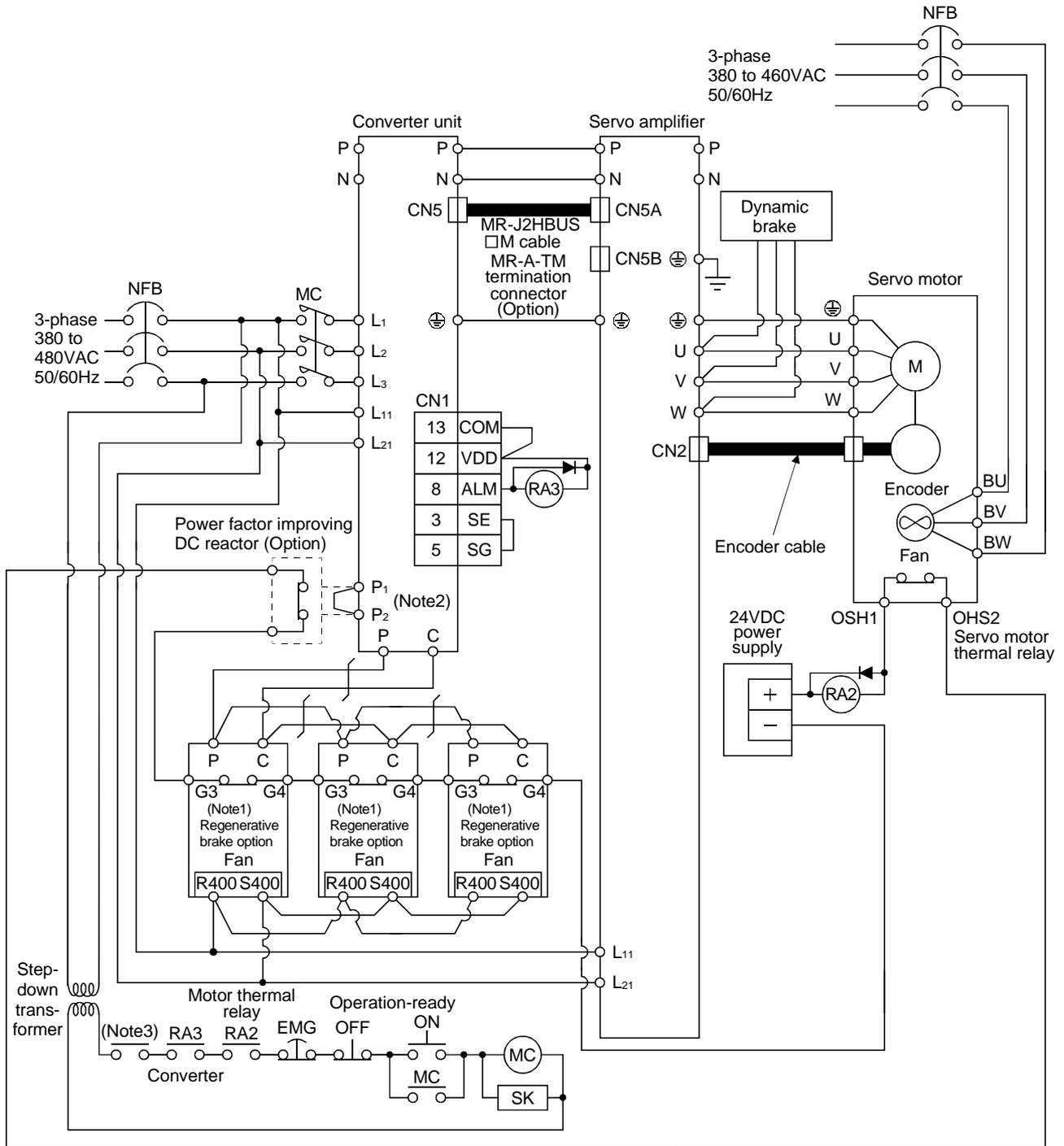


Note 1. For the MR-RB138-4. For the MR-RB138-4, three units are used as one set (permissible wattage: 3900W).

2. When using the Power factor improving DC reactor, disconnect the short bar across P1-P2.

3. SIGNALS AND WIRING

(d) MR-H□BN4



Note 1. For the MR-RB138-4. For the MR-RB138-4, three units are used as one set (permissible wattage: 3900W).

2. When using the Power factor improving DC reactor, disconnect the short bar across P1-P2.

3. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

3. SIGNALS AND WIRING

3.3.2 Terminal

Refer to Section 8.2 for the terminal block arrangement and signal layout.

(1) Converter unit

Connection Target (Application)	Abbreviation	(Note) Terminal Block	Description	
			MR-HP30KA	MR-HP55KA4
Main circuit power supply	L1 · L2 · L3	TE1-2	Connect three-phase 200 to 230VAC, 50/60Hz to L1, L2, L3.	Connect three-phase 380 to 480VAC, 50/60Hz to L1, L2, L3.
Control circuit power supply	L11 · L21	TE3	Connect single-phase 200 to 230VAC, 50/60Hz.	Connect single-phase 380 to 480VAC, 50/60Hz.
Power factor improving DC reactor	P1 · P2	TE1-1	When using the Power factor improving DC reactor, connect it after removing the connection plate across P1-P2.	
Regenerative brake	P · C	TE1-1	Connect to the P and C terminals of the regenerative brake option.	
PN power output	P · N	TE2-1 TE2-2	Connect to the P and N terminals of the converter unit. Use the accessory connection bars to make connection.	
Grounding		PE	Connect this terminal to the protective earth (PE) terminals of the servo motor and control box for grounding	

Note. The permissible tension applied to any of the terminal blocks TE1-1, TE1-2, TE2-1, TE2-2 is 350[N]. (The testing method is as specified in Section 8.10.1 (2), JIS C281 "Industrial Terminal Blocks".)

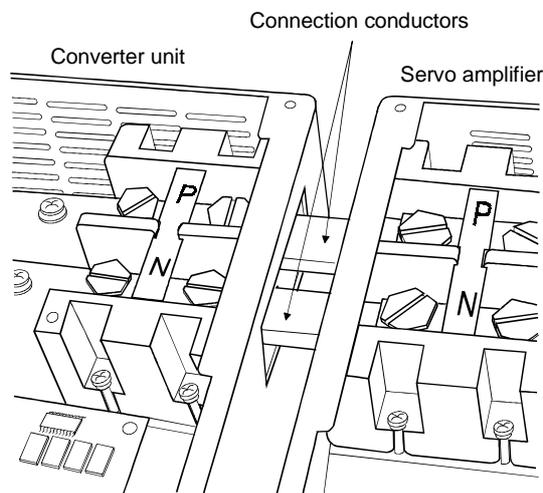
(2) Servo amplifier

Connection Target (Application)	Abbreviation	(Note) Terminal Block	Description			
			MR-J2S-□A/B	MR-H□AN/BN	MR-J2S-□ A4/B4	MR-H□ AN4/BN4
Servo motor output	U · V · W	TE1A	Connect to the servo motor power supply terminals (U, V, W).			
Control circuit power supply	L11 · L21	TE2-1 TE2-2	Connect single-phase 200 to 230VAC, 50/60Hz.		Connect single-phase 380 to 480VAC, 50/60Hz.	
PN power supply	P · N		Connect to the P and N terminals of the converter unit. Use the accessory connection bars to make connection.			
Grounding		PE	Connect this terminal to the protective earth (PE) terminals of the servo motor and control box for grounding			

Note. The permissible tension applied to any of the terminal blocks TE1-1, TE1-2, TE2-1, TE2-2 is 350[N]. (The testing method is as specified in Section 8.10.1 (2), JIS C281 "Industrial Terminal Blocks".)

3.3.3 How to use the connection bars

Connect P and N of the servo amplifier and P and N of the converter unit using the connection conductors as shown below.



3. SIGNALS AND WIRING

3.3.4 Power-on sequence

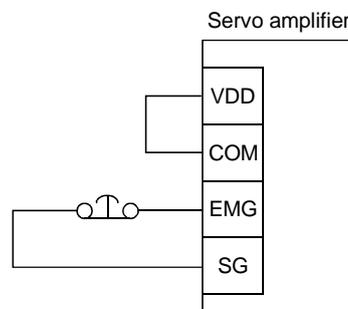
- 1) Always wire the power supply as shown in above Section 3.3.1 using the magnetic contactor with the main circuit power supply. Configure up an external sequence to switch off the magnetic contactor as soon as an alarm occurs.
- 2) Switch on the control circuit power supply L11, L21 simultaneously with the main circuit power supply or before switching on the main circuit power supply. If the main circuit power supply is not on, the display shows the corresponding warning. However, by switching on the main circuit power supply, the warning disappears and the servo amplifier will operate properly.
- 3) The servo amplifier can accept the servo-on signal (SON) about 1 second after the main circuit power supply is switched on. Therefore, when SON is switched on simultaneously with the three-phase power supply, the base circuit will switch on in about 1 second, and the ready signal (RD) will switch on in further about 20ms, making the servo amplifier ready to operate.



CAUTION

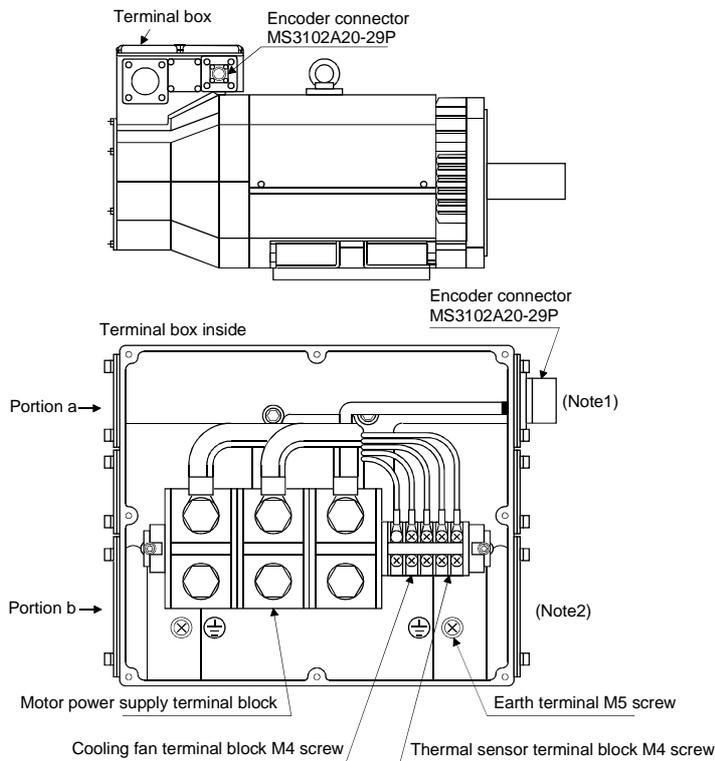
• To stop operation and switch power off immediately, provide an external emergency stop circuit.

Make up a circuit which shuts off main circuit power as soon as EMG-SG are opened at an emergency stop. Opening EMG-SG coasts the servo motor. When the optional dynamic brake is used, the servo motor comes to a sudden stop. At this time, the display shows the servo emergency stop warning (AL.E6). During ordinary operation, do not use the external emergency stop signal to alternate stop and run. If the start signal is on or a pulse train is input during an emergency stop, the servo motor will rotate as soon as the warning is reset. During an emergency stop, always shut off the run command. (For next figure is the case of MR-J2S-A.)

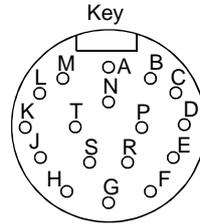


3. SIGNALS AND WIRING

3.4 Servo motor side details



Encoder connector
signal arrangement
MS3102A-29P



Pin	Signal
A	MD
B	MDR
C	MR
D	MRR
E	
F	BAT
G	LG
H	
J	

Pin	Signal
K	
L	
M	
N	SHD
P	
R	LG
S	P5
T	

	HA-LFS30K24 HA-LF30K24 HA-LFS37K24 HA-LF37K24	HA-LFS45K24 HA-LF45K24 HA-LFS55K24 HA-LF55K24 HA-LFS30K2 HA-LF30K2 HA-LFS37K2 HA-LF37K2
Motor power supply lead size	8mm ² × 2 in parallel	22mm ² × 2 in parallel
Motor power supply terminal block screw size	M8	M10
Earth screw size	M8	M10

Note 1. The encoder connector may also be fitted to portion a.
Note 2. Wiring may also be carried out from portion b.

Signal layout of terminal block



Signal Name	Abbreviation	Description																								
Power supply	U · V · W	Connect to the motor output terminals (U, V, W) of the servo amplifier. Supply power which satisfies the following specifications.																								
Cooling fan	BU · BV · BW	<table border="1"> <thead> <tr> <th rowspan="2">Item</th> <th colspan="4">Servo motor</th> </tr> <tr> <th>HA-LF30K2</th> <th>HA-LFS30K2</th> <th>HA-LF37K2</th> <th>HA-LFS37K2</th> </tr> </thead> <tbody> <tr> <td>Voltage/frequency</td> <td colspan="4">Three-phase 200 to 230VAC/60Hz Three-phase 200 to 220VAC/50Hz</td> </tr> <tr> <td>Power consumption [W]</td> <td colspan="4">40(50Hz)/63(60Hz)</td> </tr> <tr> <td>Rated voltage [V]</td> <td colspan="4">0.32(50Hz)/0.35(60Hz)</td> </tr> </tbody> </table>	Item	Servo motor				HA-LF30K2	HA-LFS30K2	HA-LF37K2	HA-LFS37K2	Voltage/frequency	Three-phase 200 to 230VAC/60Hz Three-phase 200 to 220VAC/50Hz				Power consumption [W]	40(50Hz)/63(60Hz)				Rated voltage [V]	0.32(50Hz)/0.35(60Hz)			
		Item		Servo motor																						
HA-LF30K2	HA-LFS30K2		HA-LF37K2	HA-LFS37K2																						
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Power consumption [W]	40(50Hz)/63(60Hz)																									
Rated voltage [V]	0.32(50Hz)/0.35(60Hz)																									
Motor thermal relay	OHS1 · OHS2	OHS1-OHS2 are opened when heat is generated to an abnormal temperature.																								
Earth terminal		For grounding, connect to the earth of the control box via the earth terminal of the servo amplifier.																								

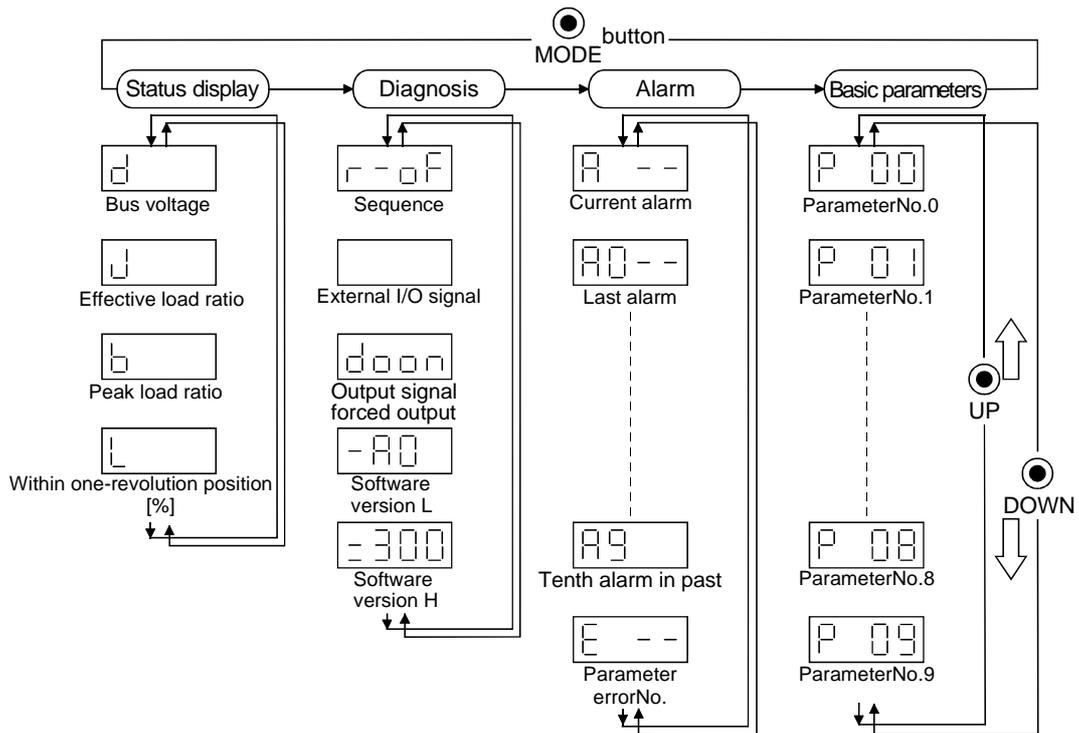
4. DISPLAY SECTION AND OPERATION SECTION OF THE CONVERTER UNIT

4. DISPLAY SECTION AND OPERATION SECTION OF THE CONVERTER UNIT

4.1 Display flowchart

Use the display (4-digit, 7-segment LED) on the front panel of the Converter unit for status display, parameter setting, etc. Set the parameters before operation, diagnose an alarm, confirm external sequences, and/or confirm the operation status.

Press the MODE, UP or DOWN button once to move the next screen.



4 DISPLAY SECTION AND OPERATION SECTION OF THE CONVERTER UNIT

4.2 Status display mode

The servo status during operation is shown on the 4-digit, 7-segment LED display. Press the "UP" or "DOWN" button to change display data as desired.

When the required data is selected, the corresponding symbol is displayed. Press the "SET" button to display that data.

The converter unit display section can show four items of data such as the effective load factor.

4.2.1 Display examples

The following table shows the display examples.

Item	Status	Display
Bus voltage	225[V]	
Effective load factor	67[%]	
Peak load factor	95[%]	
Regenerative load factor	90[%]	

4.2.2 Status display list

The following table lists the servo statuses that may be displayed.

Status Display	Symbol	Unit	Description	Indication Range
Bus voltage	d	V	The converter unit voltage is displayed.	0 to 500
Effective load factor	J	%	Continuous effective load torque is displayed. (Note) The effective value in the past 15 seconds is displayed relative to the rated current of 100%.	0 to 300
Peak load factor	b	%	The peak output is displayed. (Note) The peak value in the past 15 seconds is displayed relative to the rated torque of 100%.	0 to 300
Regenerative load factor	L	%	The percentage of regenerative power to the permissible regenerative value is displayed.	0 to 300

Note. Output = speed × torque

4 DISPLAY SECTION AND OPERATION SECTION OF THE CONVERTER UNIT

4.3 Diagnostic mode

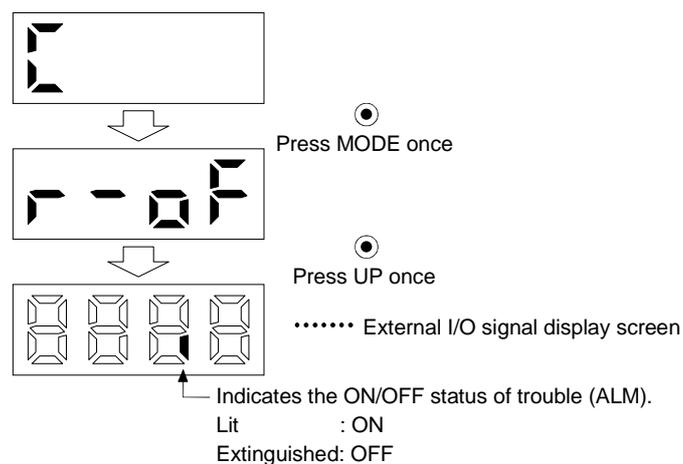
4.3.1 Diagnostic list

Name	Display	Unit
Sequence		Not ready. Indicates that the servo amplifier is being initialized or an alarm has
		Ready Indicates that the servo was switched on after completion of initialization and the servo amplifier is ready to operate.
External I/O signal display		Indicates the ON/OFF status of trouble (ALM). Lit : ON Extinguished: OFF For details, refer to Section 4.3.2.
Output signal forced output		Allows trouble (ALM) to be switched on/off forcibly. For details, refer to Section 4.3.3.
Software version Low		Indicates the version of the software.
Software version High		Indicates the system number of the software.

4.3.2 External output signal indication

You can check the ON/OFF status of the trouble (ALM) signal.

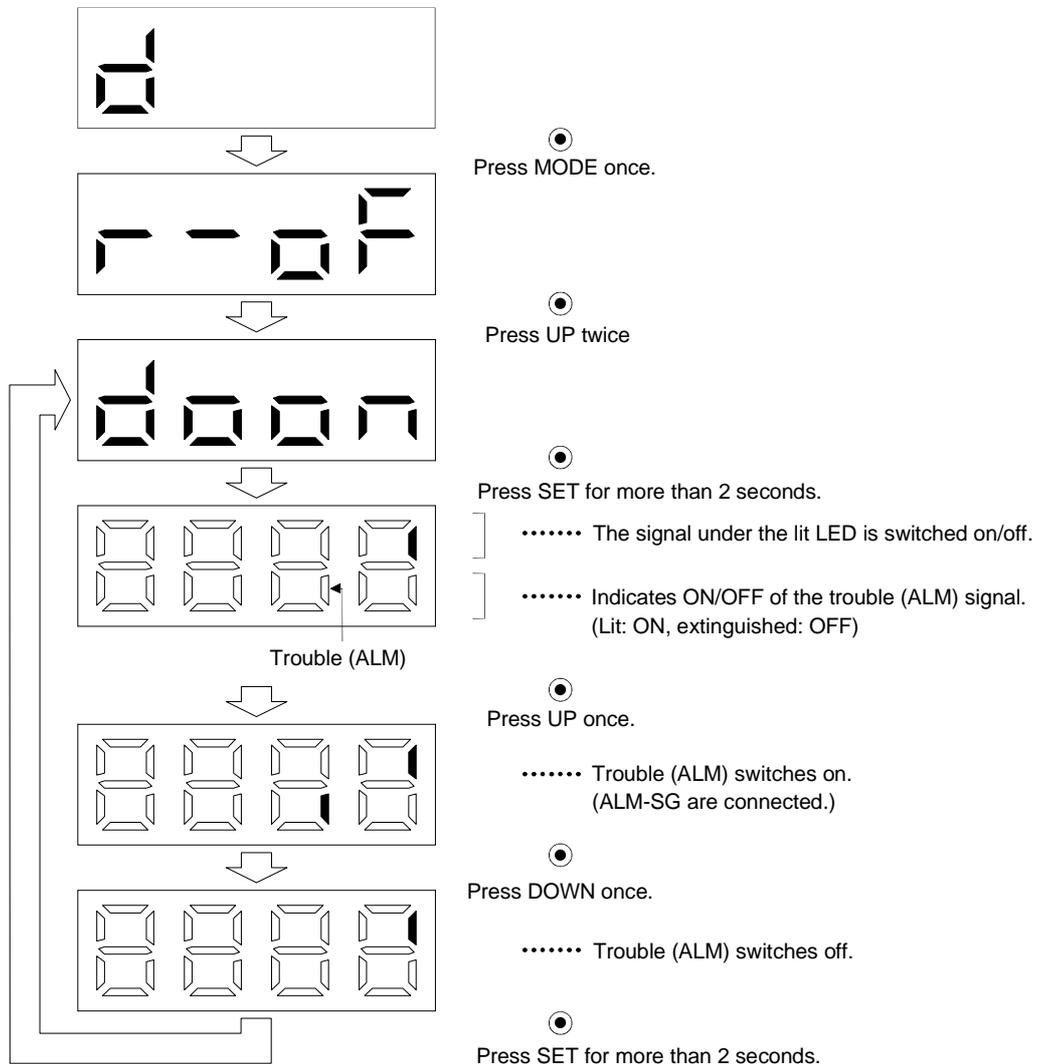
Call the display screen shown after power-on.



4 DISPLAY SECTION AND OPERATION SECTION OF THE CONVERTER UNIT

4.3.3 Output signal forced output

You can force the trouble (ALM) signal to be switched on/off, independently of the servo status. This function is used for output signal.



Call the display screen shown after power-on.

4 DISPLAY SECTION AND OPERATION SECTION OF THE CONVERTER UNIT

4.4 Alarm mode

The current alarm, parameter error and point table error are displayed.

The lower 2 digits on the display indicate the alarm number that has occurred or the parameter number in error.

Display example are shown below.

Name	Display	Description
Current alarm	A --	Indicates on occurrence of an alarm.
	A. 33	Indicates that overvoltage (A.33) occurred. Flickers at alarm occurrence.
Alarm history	A.050	Indicates that the last alarm is overload (A.50).
	A.133	Indicates that the second alarm in the past is overvoltage (A.33).
	A.2 10	Indicates that the third alarm in the past is undervoltage (A.10).
	A.3 10	Indicates that the fourth alarm in the past is undervoltage (A.10).
	A.4 10	Indicates that the fifth alarm in the past is undervoltage (A.10).
	A.550	Indicates that the sixth alarm in the past is overload (A.50).
	A.6 --	Indicates that there is no seventh alarm in the past.
	A.7 --	Indicates that there is no eighth alarm in the past.
	A.8 --	Indicates that there is no ninth alarm in the past.
	A.9 --	Indicates that there is no tenth alarm in the past.
Parameter error	E. --	Indicates no occurrence of parameter error (A37).
	E. 01	Indicates that the data of parameter No.1 is faulty.

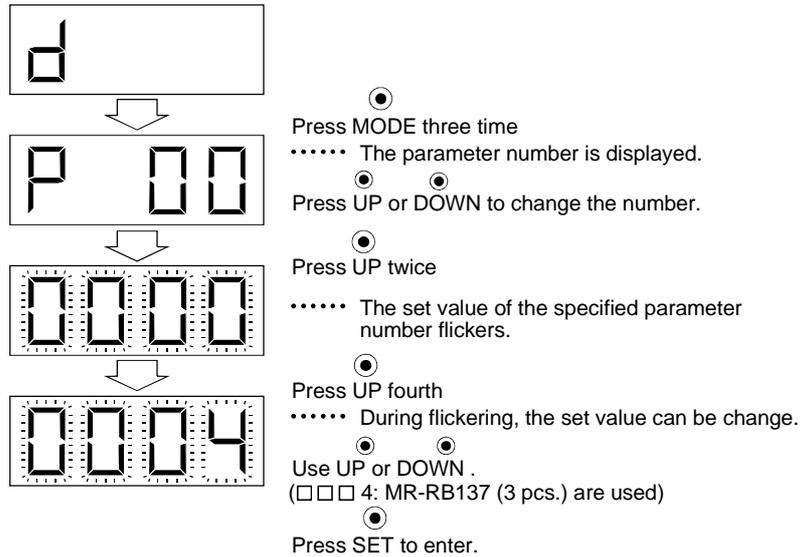
Functions at occurrence of an alarm

- (1) Any mode screen displays the current alarm.
- (2) The other screen is visible during occurrence of an alarm. At this time, the decimal point in the fourth digit flickers.
- (3) To clear any alarm, switch power off, then on or press the "SET" button on the current alarm screen.
Note that this should be done after removing the cause of the alarm.

4 DISPLAY SECTION AND OPERATION SECTION OF THE CONVERTER UNIT

4.5 Parameter mode

The following example gives the operation procedure after power-on for use of the regenerative brake options (MR-RB137).



To shift to the next parameter, press the "UP"/"DOWN" button.

When changing the parameter No.0 setting, change its set value, then switch power off once and switch it on again to make the new value valid.

5. PARAMETER

5. PARAMETER

5.1 Converter unit

No.	Symbol	Name and function	Initial value	Unit	Control Mode				
0	*STY	<p>Control mode, regenerative brake option selection Used to select the control mode regenerative brake option.</p> <table border="1" style="margin-left: 20px;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px;"></td> </tr> </table> <p style="margin-left: 40px;">└─ Select the regenerative brake option. "1" and "2" are provided for maker adjustment and should not be set. 0: No used 1: MR-RB136-4 2: MR-RB138-4 (3pcs.) } Only for MR-HP55KA4 3: MR-RB139 4: MR-RB137 (3 pcs.) } Only for MR-HP30KA</p> <p style="margin-left: 40px;">"1" and "2" are the set values for the MR-HP55KA4 only, and "3" and "4" are those for the MR-HP30KA only. Wrong setting will result in parameter alarm (AL.37).</p>	0	0	0		0000		Refer to Name and function column.
0	0	0							
1		For manufacturer	0000						
2		Do not change this value any means.	0000						
3			0001						
4	*DMD	<p>Status display selection Used to select the status display shown at power-on.</p> <table border="1" style="margin-left: 20px;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px;"></td> </tr> </table> <p style="margin-left: 40px;">└─ Status display of converter unit display section at power-on. 0: Bus voltage (initial value) 1: Effective load ratio 2: Peak load ratio 3: Regenerative load ratio</p>	0	0	0		0000		Refer to Name and function column.
0	0	0							
5	*ACL	<p>Alarm history clear Used to select alarm history clear</p> <table border="1" style="margin-left: 20px;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px;"></td> </tr> </table> <p style="margin-left: 40px;">└─ Alarm history clear 0: Invalid 1: Valid</p> <p style="margin-left: 40px;">Used to select alarm history clear. When alarm history clear is made valid, the alarm history is cleared at next power-on. After the alarm history is cleared, the setting is automatically made invalid (reset to 0).</p>	0	0	0		0000		Refer to Name and function column.
0	0	0							
6			0						
7		For manufacturer	0						
8		Do not change this value any means.	0						
9			0000						

5. PARAMETER

5.2 Servo amplifier

POINT

▪ The parameters of each servo amplifier are basically the same as those of the 11k to 22kW servo amplifier. This section describes the differences in parameters between each servo amplifier and the 11k to 22kW servo amplifier.

5.2.1 MELSERVO-J2-Super series

(1) MR-J2S-□

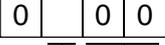
No.	Symbol	Name and function	Initial value	Unit
0	*STY	Control mode/regenerative brake option selection <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> </div> <p style="margin-left: 20px; margin-top: 5px;">Refer to the MR-J2S-□A Servo Amplifier Instruction Manual. Regenerative brake option selection Always set "0".</p>	0000	/

(2) MR-J2S-□A4

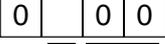
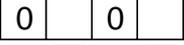
No.	Symbol	Name and function	Initial value	Unit																																							
0	*STY	Control mode/regenerative brake option selection <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> </div> <p style="margin-left: 20px; margin-top: 5px;">Refer to the MR-J2S-□A Servo Amplifier Instruction Manual. Regenerative brake option selection Always set "0".</p>	0000	/																																							
17	MOD	Analog monitor output <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">0</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> </div> </div> <table border="1" style="margin-left: 20px; margin-top: 10px; border-collapse: collapse;"> <thead> <tr> <th>Setting</th> <th>Analog monitor 2 (MO2)</th> <th>Analog monitor 1 (MO1)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td colspan="2">Servo motor speed ($\pm 8V$/max. speed)</td> </tr> <tr> <td>1</td> <td colspan="2">Torque ($\pm 8V$/max. torque)</td> </tr> <tr> <td>2</td> <td colspan="2">Motor speed ($+8V$/max. speed)</td> </tr> <tr> <td>3</td> <td colspan="2">Torque ($+8V$/max. torque)</td> </tr> <tr> <td>4</td> <td colspan="2">Current command ($\pm 8V$/max. current command)</td> </tr> <tr> <td>5</td> <td colspan="2">Command speed (± 8/max. speed)</td> </tr> <tr> <td>6</td> <td colspan="2">Droop pulses ($\pm 10V$/128 pulses)</td> </tr> <tr> <td>7</td> <td colspan="2">Droop pulses ($\pm 10V$/2048 pulses)</td> </tr> <tr> <td>8</td> <td colspan="2">Droop pulses ($\pm 10V$/8192 pulses)</td> </tr> <tr> <td>9</td> <td colspan="2">Droop pulses ($\pm 10V$/32768 pulses)</td> </tr> <tr> <td>A</td> <td colspan="2">Droop pulses ($\pm 10V$/131072 pulses)</td> </tr> <tr> <td>B</td> <td colspan="2">Bus voltage ($+8V$/800V)</td> </tr> </tbody> </table>	Setting	Analog monitor 2 (MO2)	Analog monitor 1 (MO1)	0	Servo motor speed ($\pm 8V$ /max. speed)		1	Torque ($\pm 8V$ /max. torque)		2	Motor speed ($+8V$ /max. speed)		3	Torque ($+8V$ /max. torque)		4	Current command ($\pm 8V$ /max. current command)		5	Command speed (± 8 /max. speed)		6	Droop pulses ($\pm 10V$ /128 pulses)		7	Droop pulses ($\pm 10V$ /2048 pulses)		8	Droop pulses ($\pm 10V$ /8192 pulses)		9	Droop pulses ($\pm 10V$ /32768 pulses)		A	Droop pulses ($\pm 10V$ /131072 pulses)		B	Bus voltage ($+8V$ /800V)		0100	/
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B	Bus voltage ($+8V$ /800V)																																										

5. PARAMETER

(3) MR-J2S-□B

No.	Symbol	Name and function	Initial value	Unit
2	*REG	Regenerative brake resistor  Regenerative brake option selection Always set "0". Refer to the MR-J2S-□B Servo Amplifier Instruction Manual.	0000	

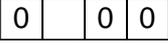
(4) MR-J2S-□B4

No.	Symbol	Name and function	Initial value	Unit																																							
2	*REG	Regenerative brake resistor  Regenerative brake option selection Always set "0". Refer to the MR-J2S-□B Servo Amplifier Instruction Manual.	0000																																								
22	MOD	Analog monitor output  <table border="1" data-bbox="469 1120 1046 1646"> <thead> <tr> <th>Setting</th> <th>Analog monitor 1 (MO1)</th> <th>Analog monitor 2 (MO2)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td colspan="2">Servo motor speed ($\pm 8V$/max. speed)</td> </tr> <tr> <td>1</td> <td colspan="2">Torque ($\pm 8V$/max. torque)</td> </tr> <tr> <td>2</td> <td colspan="2">Motor speed (+8V/max. speed)</td> </tr> <tr> <td>3</td> <td colspan="2">Torque (+8V/max. torque)</td> </tr> <tr> <td>4</td> <td colspan="2">Current command ($\pm 8V$/max. current command)</td> </tr> <tr> <td>5</td> <td colspan="2">Command speed (± 8/max. speed)</td> </tr> <tr> <td>6</td> <td colspan="2">Droop pulses ($\pm 10V$/128 pulses)</td> </tr> <tr> <td>7</td> <td colspan="2">Droop pulses ($\pm 10V$/2048 pulses)</td> </tr> <tr> <td>8</td> <td colspan="2">Droop pulses ($\pm 10V$/8192 pulses)</td> </tr> <tr> <td>9</td> <td colspan="2">Droop pulses ($\pm 10V$/32768 pulses)</td> </tr> <tr> <td>A</td> <td colspan="2">Droop pulses ($\pm 10V$/131072 pulses)</td> </tr> <tr> <td>B</td> <td colspan="2">Bus voltage (+8V/800V)</td> </tr> </tbody> </table>	Setting	Analog monitor 1 (MO1)	Analog monitor 2 (MO2)	0	Servo motor speed ($\pm 8V$ /max. speed)		1	Torque ($\pm 8V$ /max. torque)		2	Motor speed (+8V/max. speed)		3	Torque (+8V/max. torque)		4	Current command ($\pm 8V$ /max. current command)		5	Command speed (± 8 /max. speed)		6	Droop pulses ($\pm 10V$ /128 pulses)		7	Droop pulses ($\pm 10V$ /2048 pulses)		8	Droop pulses ($\pm 10V$ /8192 pulses)		9	Droop pulses ($\pm 10V$ /32768 pulses)		A	Droop pulses ($\pm 10V$ /131072 pulses)		B	Bus voltage (+8V/800V)		0001	
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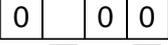
5. PARAMETER

5.2.2 MELSERVO-H series

(1) MR-H-□AN

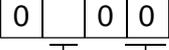
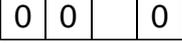
No.	Symbol	Name and function	Initial value	Unit
2	*STY	Function selection 3  Refer to the MR-H□AN Servo Amplifier Instruction Manual. Regenerative brake option selection Always set "0".	0000	
21	*OP2	Function selection 3  Low acoustic noise mode selection 2: Standard 3: Low noise Refer to the MR-H□AN Servo Amplifier Instruction Manual. Refer to the MR-H□AN Servo Amplifier Instruction Manual.	0002	
56	DIF	DI signal filter	1000	

(2) MR-H-□AN4

No.	Symbol	Name and function	Initial value	Unit
2	*STY	Servo response  Refer to the MR-H□AN Servo Amplifier Instruction Manual. Regenerative brake option selection Always set "0".	0000	
21	*OP2	Function selection 3  Low acoustic noise mode selection 2: Standard 3: Low noise Refer to the MR-H□AN Servo Amplifier Instruction Manual. Refer to the MR-H□AN Servo Amplifier Instruction Manual.	0002	
56	DIF	DI signal filter	2000	

5. PARAMETER

(3) MR-H□BN/BN4

No.	Symbol	Name and function	Initial value	Unit
2	*REG	Regenerative brake resistor  Regenerative brake option selection Always set "0". Refer to the MR-H□BN Servo Amplifier Instruction Manual.	0000	
23	*OP1	Optional function 1  Low acoustic noise mode selection 2: Standard 3: Low noise	0020	

6. INSPECTION

6. INSPECTION

WARNING

- Before starting maintenance and/or inspection, make sure that the charge lamp is off more than 20 minutes after power-off. Then, confirm that the voltage is safe in the tester or the like. Otherwise, you may get an electric shock.
- Any person who is involved in inspection should be fully competent to do the work. Otherwise, you may get an electric shock. For repair and parts replacement, contact your safes representative.

POINT

- Do not test the servo amplifier with a megger (measure insulation resistance), or it may become faulty.
- Do not disassemble and/or repair the equipment on customer side.

6.1 Inspection

It is recommended to make the following checks periodically:

- 1) Check for loose terminal block screws. Retighten any loose screws.
- 2) Check the servo motor bearings, brake section, etc. for unusual noise.
- 3) Check the cables and the like for scratches and cracks. Perform periodic inspection according to operating conditions.
- 4) Check the servo motor shaft and coupling for misalignment.

6.2 Life

The following parts must be changed periodically as listed below. If any part is found faulty, it must be changed immediately even when it has not yet reached the end of its life, which depends on the operating method and environmental conditions.

For parts replacement, please contact your sales representative.

Part Name	Life Guideline
Smoothing capacitor	10 years
Cooling fan	10,000 to 30,000 hours (2 to 3 years)

6. INSPECTION

(1) Smoothing capacitor

Affected by ripple currents, etc. and deteriorates in characteristic. The life of the capacitor greatly depends on ambient temperature and operating conditions. The capacitor will reach the end of its life in 10 years of continuous operation in normal air-conditioned environment.

(2) Relays

Their contacts will wear due to switching currents and contact faults occur. Relays reach the end of their life when the cumulative number of power-on and emergency stop times is 100,000, which depends on the power supply capacity.

(3) Converter unit/Servo amplifier cooling fan

The cooling fan bearings reach the end of their life in 10,000 to 35,000 hours. Normally, therefore, the fan must be changed in a few years of continuous operation as a guideline.

It must also be changed if unusual noise or vibration is found during inspection.

7. TROUBLESHOOTING

7. TROUBLESHOOTING

7.1 Converter unit

7.1.1 Alarms and warning list

When a fault occurs during operation, the corresponding alarm or warning is displayed. If any alarm or warning has occurred, refer to Section 6.2.2 or 6.2.3 and take the appropriate action. Switch power off, then on to deactivate the alarm. The alarms marked "○" in the Alarm Deactivation column of the table can be deactivated by pressing the "RES" key of the servo amplifier side parameter unit or switching on the reset signal (RES).

	Indication	Function Name	Alarm Deactivation
Alarm	A.10	Under voltage	○
	A.12	Memory alarm 1	
	A.13	Clock alarm	
	A.15	Memory alarm 2	
	A.30	Regenerative alarm	
	A.33	Over voltage	○
	A.37	Parameter alarm	
	A.45	Main circuit device overheat	○
	A.50	Over load 1	
	A.51	Over load 2	
	8888	Watchdog	
Warning	A.E0	Excessive regenerative load warning	
	A.E1	Over load warning	
	A.E9	Undervoltage warning	

7.1.2 Remedies for alarms



CAUTION

When any alarm has occurred, eliminate its cause, ensure safety, then reset the alarm, and restart operation. Otherwise, injury may occur.

POINT

- When any of the following alarms has occurred, always remove its cause and allow about 30 minutes for cooling before resuming operation. If operation is resumed by switching control circuit power off, then on to reset the alarm, the converter unit and regenerative brake option may become faulty.
- Regenerative alarm (A.30)
- Overload 1 (A.50)
- Overload 2 (A.51)
- The alarms can be deactivated by switching power off, then on, by pressing the "RES" key of the parameter unit or by turning on the reset signal (RES).

When an alarm occurs, the trouble (ALM) signal switches off and the display section shows the alarm number.

Remove the cause of the alarm in accordance with this section.

7. TROUBLESHOOTING

Indication	Name	Definition	Cause	Action
A.10	Undervoltage	Control power supply voltage dropped to the following voltage.	1. Power supply voltage is low.	Review the power supply.
			2. Instantaneous control power failure occurred for more than 100ms.	
			3. Power switched on within 5s after it had switched off.	
			4. Shortage of power supply capacity caused the power supply voltage to drop at start, etc.	
			5. Faulty parts in the servo amplifier	Change the Converter unit.
			Checking method Alarm (A.10) occurs if power is switched on after connectors disconnected.	
A.12	Memory alarm 1	RAM, ROM memory fault	Failure of the part in the converter unit.	Change the Converter unit.
A.13	Clock alarm	Printed board fault	Checking method Alarm (A.10, A.13, A.15) occurs if power is switched on after connectors disconnected.	
A.15	Memory alarm 2	EED-ROM fault		
A.30	Regenerative alarm	Permissible regenerative power of the built-in regenerative brake resistor or regenerative brake option is exceeded.	1. Wrong setting of parameter No. 0	Set correctly.
			2. Regenerative brake option is not connected.	Connect correctly.
			3. High-duty operation or continuous regenerative operation caused the permissible regenerative power of the regenerative brake option to be exceeded.	1. Reduce the frequency of positioning. 2. Use the regenerative brake option of larger capacity. 3. Reduce the load.
			Checking method Call the status display and check the regenerative load ratio.	
			4. Power supply voltage is abnormal. MR-HP30KA: 260VAC or more MR-HP55KA4: 520VAC or more	Review power supply
			5. Regenerative transistor faulty.	Change the Converter unit.
			Checking method 1) The regenerative brake option has overheated abnormally. 2) The alarm occurs even after removal of the built-in regenerative brake resistor or regenerative brake option.	
6. Regenerative brake option faulty.	Change Converter unit or regenerative brake option.			
7. Unusual overheat due to cooling fan stop	1. Change the Converter unit or cooling fan. 2. Reduce ambient temperature.			
A.33	Over voltage	Converter bus voltage exceeded to following voltage. MR-HP30KA: 400VDC MR-HP55KA4: 800VDC	1. Regenerative brake option is not used.	Use the regenerative brake option.
			2. Though the regenerative brake option is used, the parameter No. 0 setting is "□□□0 (not used)".	Make correct setting.
			3. Lead of regenerative brake option is open or disconnected.	1. Change lead. 2. Connect correctly.
			4. Regenerative transistor faulty.	
			5. Wire breakage of regenerative brake option	1. For wire breakage of built-in regenerative brake resistor, change Converter unit. 2. For wire breakage of regenerative brake option, change regenerative brake option.
			6. Capacity of regenerative brake option is insufficient.	Add regenerative brake option or increase capacity.
A.37	Parameter alarm	Parameter setting is wrong.	1. Servo amplifier fault caused the parameter setting to be rewritten.	Change the Converter unit.
			2. Parameter data improper-setting.	Set parameter correctly.
A.45	Main circuit device overheat	Main circuit device overheat	1. Converter unit faulty.	Change the Converter unit
			2. The power supply was turned on and off continuously by overloaded status.	The drive method is reviewed.
			3. Air cooling fan of servo amplifier stops.	The cooling method is reviewed.

7. TROUBLESHOOTING

Indication	Name	Definition	Cause	Action
A.50	Over load 1	Load exceeded overload protection characteristic of Converter unit	Converter unit is used in excess of its continuous output current.	1. Reduce load. 2. Review operation pattern.
A.51	Overload 2	Machine collision or the like caused max. output current to flow successively for several seconds.	Machine struck something.	1. Review operation pattern. 2. Install limit switches.
8888	Watchdog	CPU/part is faulty.	Failure of the part in the converter unit. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> Checking method Alarm (8888) occurs if all connectors are disconnected and power is switched on. </div>	Change the converter unit.

7.1.3 Remedies for warnings

Continuing operation in an alarm occurrence status may result in an alarm or disable proper operation. Eliminate the cause of the warning according to this section. The warning displayed will disappear when the cause of its occurrence is resolved.

Indication	Name	Definition	Cause	Action
A.E0	Excessive regenerative load warning	There is a possibility that regenerative power may exceed permissible regenerative power of regenerative brake option.	Regenerative power increased to 85% or more of permissible regenerative power of built-in regenerative brake resistor or regenerative brake option. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> Checking method Call the status display and check regenerative load ratio. </div>	1. Reduce frequency of positioning. 2. Change regenerative brake option for the one with larger capacity. 3. Reduce load.
A.E1	Over load warning	There is a possibility that overload alarm 1 or 2 may occur.	Load increased to 85% or more of overload alarm 1 or 2 occurrence level. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;"> Cause, checking method Refer to A.50,51. </div>	Refer to A.50, A.51.
A.E9	Undervoltage warning	Bus voltage dropped. MR-HP30KA: 180V MR-HP55KA4: 360V	1. Power supply voltage is low.	Review power supply.
			2. P and/or N is not connected.	Carry out wiring properly.

7.1.4. Clearing the alarm history

You can clear the alarm numbers stored in the alarm history of the alarm mode. To ensure that you can control the alarms that will occur after regular operation, make this setting before starting regular operation to clear the alarm history.

After setting "0001" in parameter No. 5, switch power off once. Switching it on again clears the alarm history. At this time, the parameter No. 5 setting returns to "0000".

7. TROUBLESHOOTING

7.2 Servo amplifier

POINT	<ul style="list-style-type: none"> This section provides the alarms which are different in definition from those of the servo amplifiers of 22kW and less.
-------	---

7.2.1 Alarm codes

POINT	<ul style="list-style-type: none"> The MR-J2S-□B/B4 and MR-H□BN/BN4 do not have alarm codes.
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Indication	(Note)Alarm Code										Function Name	Parameter Unit Screen Display
	MR-J2S-□A/A4			MR-H□AN/AN4								
				Servo amplifier output			MR-H-D01 output					
	CN1B 19	CN1A 18	CN1A 19	ZSP	PF	RD	D003	D002	D001	D000		
AL.1b	0	1	0	0	1	0	0	0	1	0	Converter RD off	Converter RD off

Note. 0: OFF
1: ON

7. TROUBLESHOOTING

7.2.2 Alarm corrective actions

POINT
▪ The parameter unit screen is displayed by the MELSERVO-H series.

Indication	Name	Definition	Parameter Unit Screen Display		Cause	Action	
			Current Alarm (name and definition)	Alarm Occurrence Factor			
AL.10	Under voltage	Converter unit voltage dropped.	Under volt	Power Volt under 160V 15 ms IPF	1. Bus voltage (across P-N) of the converter unit dropped to less than the following voltage. 200V class: 200VDC 400V class: 400VDC	Review the power supply.	
				Power Volt under 160V 15ms IPF	2. Power failed instantaneously. Main circuit power supply: 10ms or less Control circuit power supply: 100ms or less		
				Insuf. Power capacity	3. Shortage of power supply capacity caused the power supply voltage to drop at start, etc.		
						4. Power switched on within 5s after it had switched off.	Change the Servo amplifier.
						5. Faulty parts in the servo amplifier <div style="border: 1px solid black; padding: 5px; width: fit-content;"> — Checking method — Alarm (AL.10) occurs if power is switched on after all connectors are disconnected. </div>	
Al.1b	Converter RD off	Servo on (SON) signal switched on when the ready (RD) of the converter was off.	Converter RD off	Converter RD off	1. Bus voltage is low. 2. Alarm occurred in the converter.	Remove the cause of the converter alarm and deactivate the alarm.	
AL.33	Over voltage	Converter bus voltage exceeded to following voltage. 200V class: 400VDC 400V class: 800VDC.	Over volt.	Reg. Resist. Has trouble	1. Lead of regenerative brake option is open or disconnected.	1. Change lead. 2. Connect correctly.	
				Reg. Tr. damaged	2. Regenerative brake transistor failed.		
				Reg. Resist has trouble	3. Wire breakage of built-in regenerative brake resistor or regenerative brake option		
				Power volt exceeded	4. Capacity of regenerative brake option is insufficient.	Increase regenerative brake option capacity.	
					5. Power supply voltage high.	Review the power supply.	

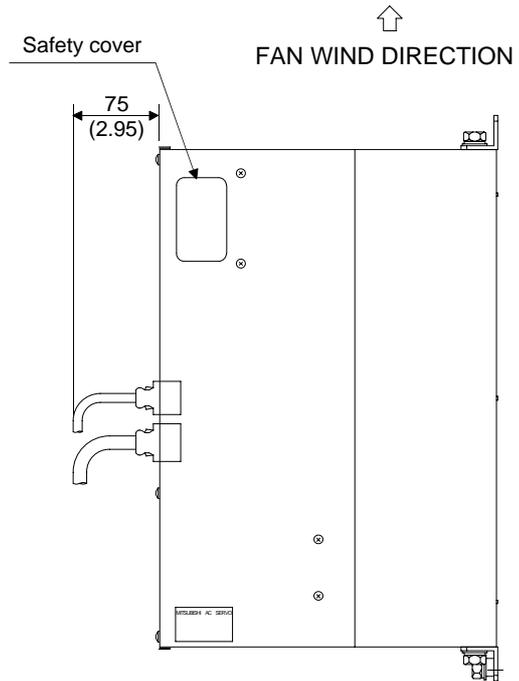
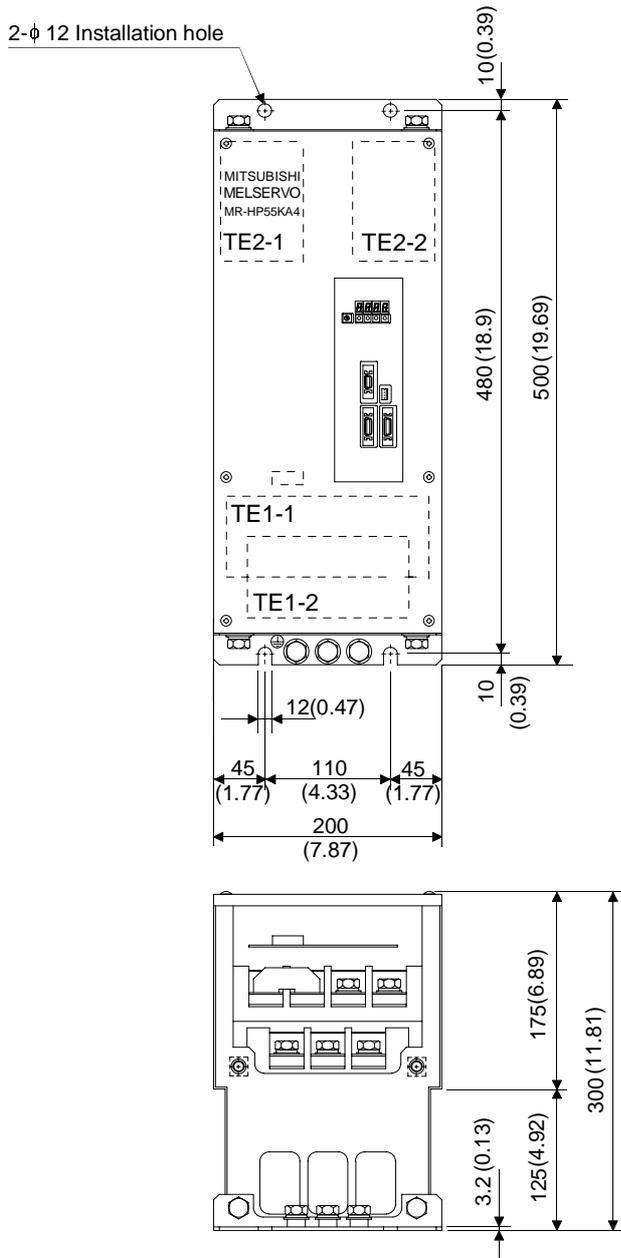
8. OUTLINE DIMENSIONAL DRAWINGS

8. OUTLINE DIMENSIONAL DRAWINGS

POINT
 • Refer to Section 2.2. for the mounting dimensional drawing.

8.1 Converter unit (MR-HP30KA/MR-HP55KA4)

[Unit: mm]
 ([Unit: in])



Mass: 22kg(48.50 lb)

• Terminal block signal layout

- TE1-1

P1	P2	P	C
----	----	---	---

 Terminal block screw: M10
 Tightening torque: 12.0[N·m]
- TE1-2

L1	L2	L3
----	----	----

 Terminal block screw: M10
 Tightening torque: 12.0[N·m]
- TE2-1
 TE2-2

P
N

 Terminal block screw: M10
 Tightening torque: 12.0[N·m]
- TE3

L11	L21
-----	-----

 Terminal block screw: M3
 Tightening torque: 0.5 to 0.6[N·m]
- Terminal block screw: M10
 Tightening torque: 12.0[N·m]

BC310C252A

- Attachment screw
 Screw: M10
 Tightening torque: 26.5[N·m]

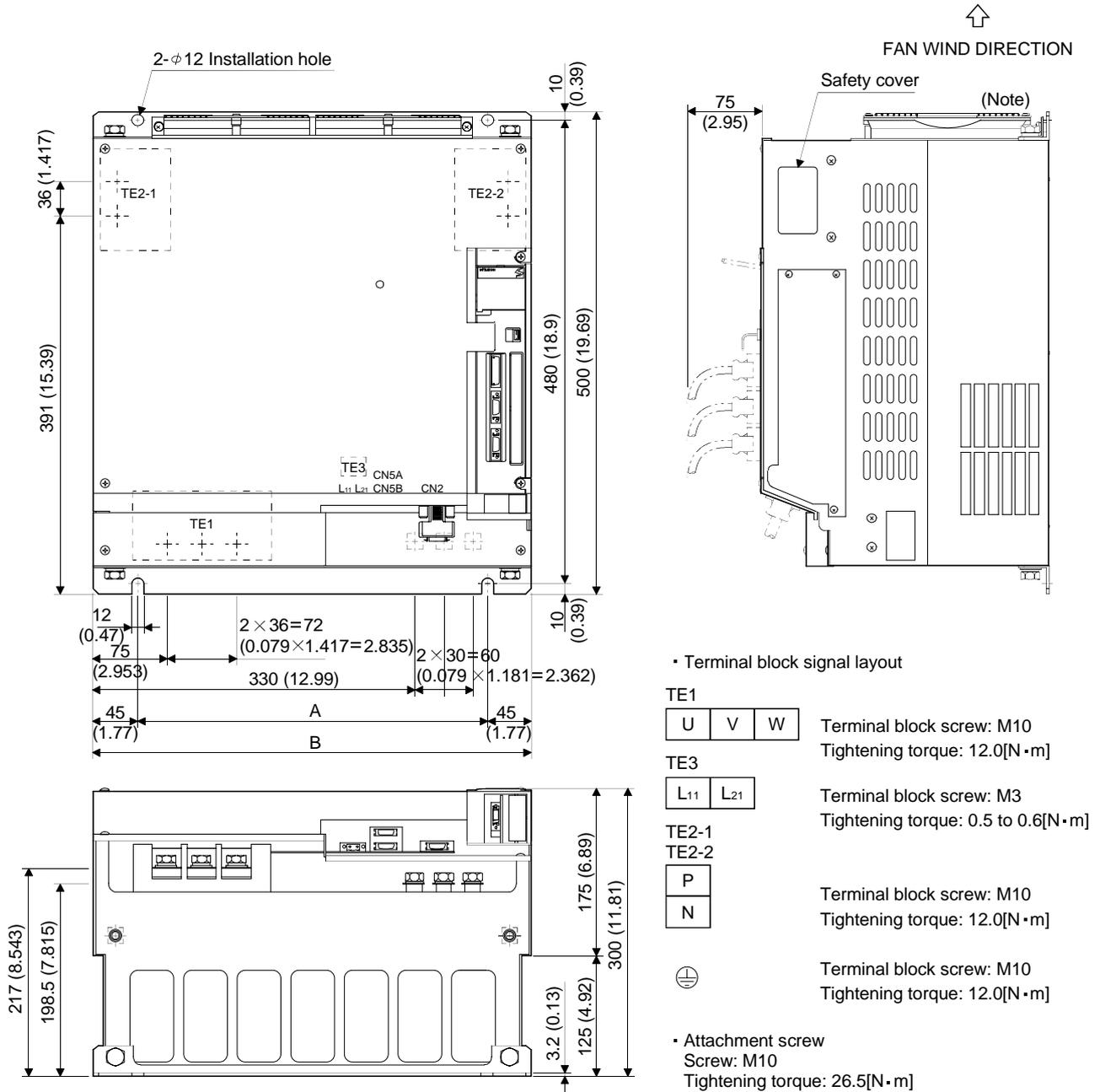
8. OUTLINE DIMENSIONAL DRAWINGS

8.2 Servo amplifier

8.2.1 MELSERVO-J2-Super series

[Unit: mm]
([Unit: in])

Servo Amplifier	Variable Dimensions [mm]([in])		Mass [kg]([lb])
	A	B	
MR-J2S-30KA4/B4	290 (11.42)	380 (14.96)	36 (79.37)
MR-J2S-30KA/B MR-J2S-37KA/B	360 (14.17)	450 (17.72)	47 (103.62)
MR-J2S-37KA4/B4 MR-J2S-45KA4/B4 MR-J2S-55KA4/B4			



Note. For the MR-J2S-30KA4/B4, the fan is built in.

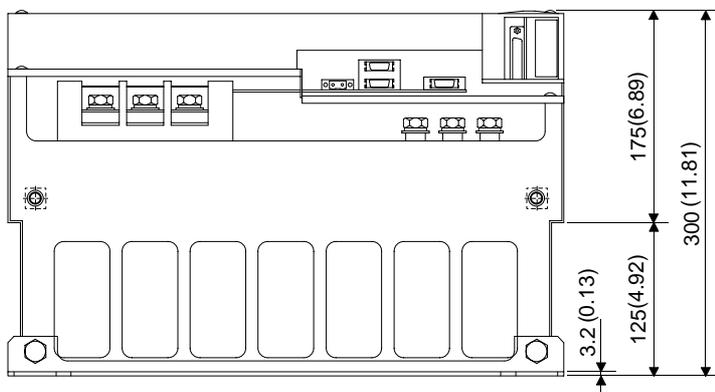
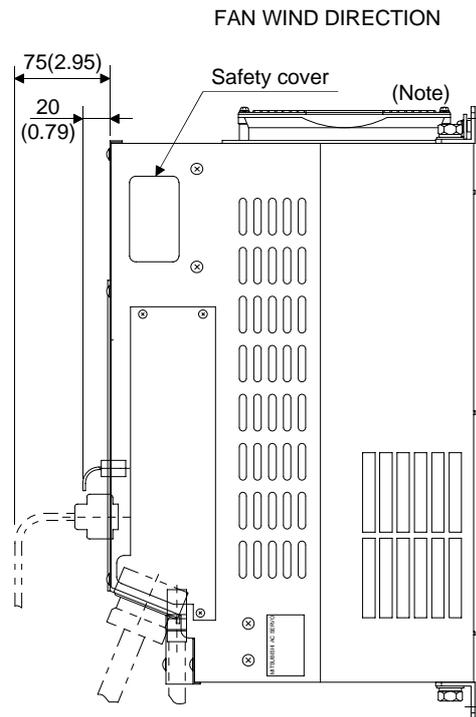
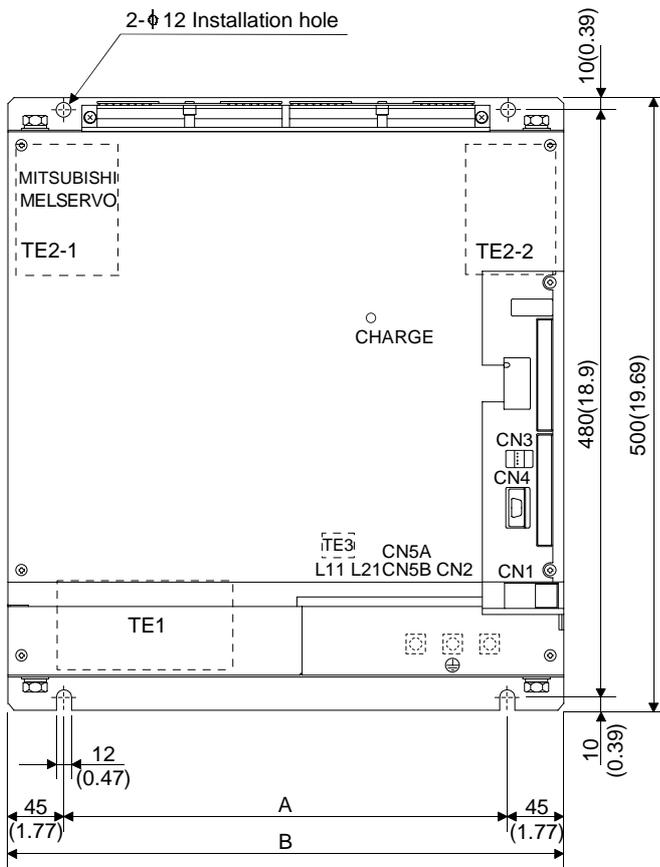
8. OUTLINE DIMENSIONAL DRAWINGS

8.2.2 MELSERVO-H series

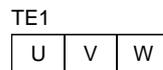
(1) MR-H□AN/AN4

[Unit: mm]
([Unit: in])

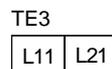
Servo Amplifier	Variable Dimensions [mm]([in])		Mass [kg]([lb])
	A	B	
MR-H30KAN4	290 (11.42)	380 (14.96)	36 (79.37)
MR-H3AKAN MR-H37KAN4 MR-H37KAN MR-H45KAN4 MR-H55KAN4	360 (14.17)	450 (17.72)	47 (103.62)



• Terminal block signal layout



Terminal block screw: M10
Tightening torque: 12.0[N·m]



Terminal block screw: M3
Tightening torque: 0.5 to 0.6[N·m]



Terminal block screw: M10
Tightening torque: 12.0[N·m]



Terminal block screw: M10
Tightening torque: 12.0[N·m]

• Attachment screw
Screw: M10
Tightening torque: 26.5[N·m]

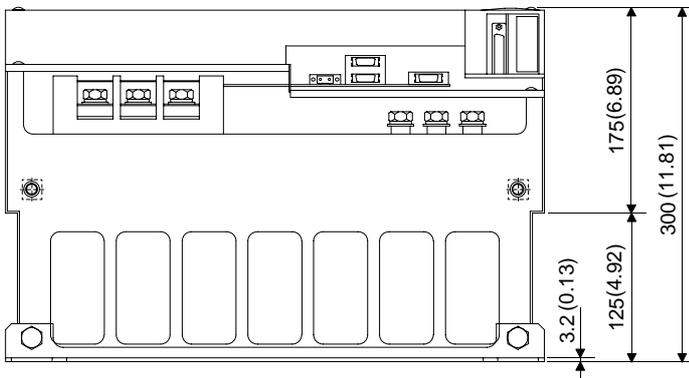
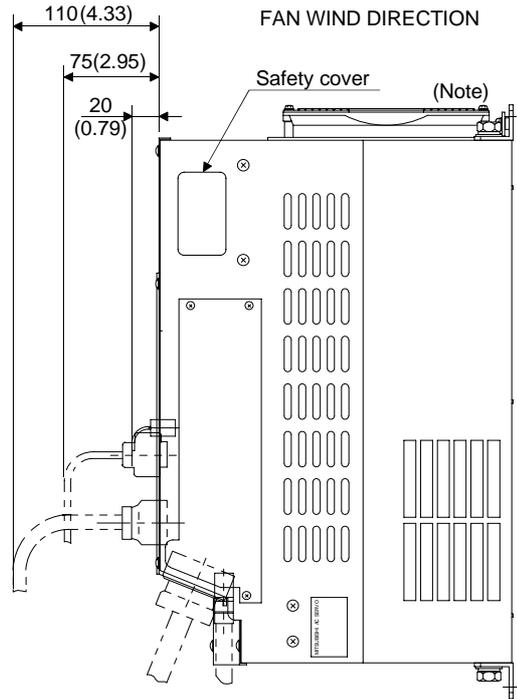
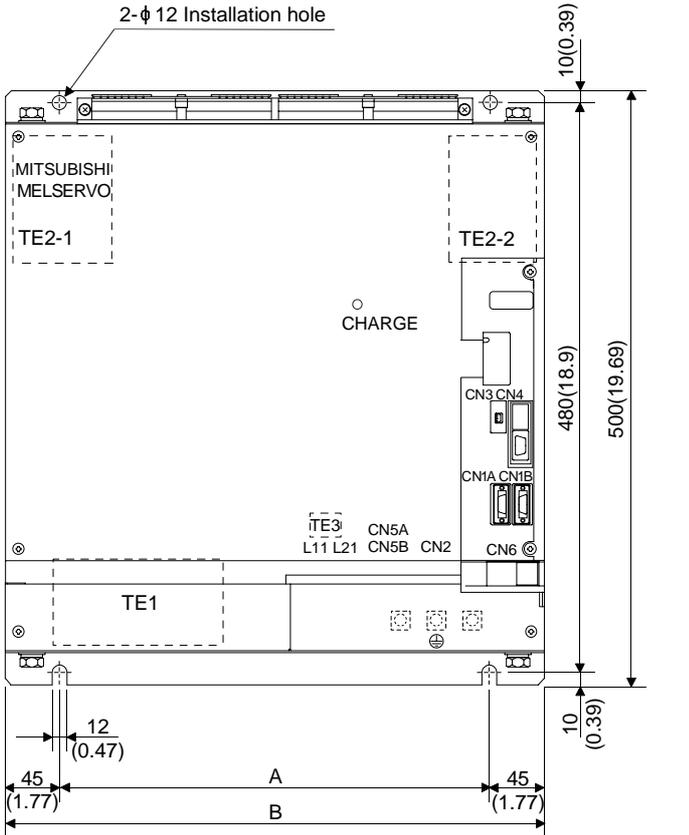
Note. For the MR-H30AN4, the fan is built in.

8. OUTLINE DIMENSIONAL DRAWINGS

(2) MR-H30KBN/BN4

[Unit: mm]
[Unit: in]

Servo Amplifier	Variable Dimensions [mm]([in])		Mass [kg]([lb])
	A	B	
MR-H30KBN4	290 (11.42)	380 (14.96)	36 (79.37)
MR-H30KBN MR-H37KBN4 MR-H37KBN MR-H45KBN4 MR-H55KBN4	360 (14.17)	450 (17.72)	47 (103.62)



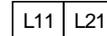
• Terminal block signal layout

TE1



Terminal block screw: M10
Tightening torque: 12.0[N·m]

TE3



Terminal block screw: M3
Tightening torque: 0.5 to 0.6[N·m]

TE2-1

TE2-2



Terminal block screw: M10
Tightening torque: 12.0[N·m]



Terminal block screw: M10
Tightening torque: 12.0[N·m]

• Attachment screw

Screw: M10
Tightening torque: 26.5[N·m]

Note. For the MR-H30BN4, the fan is built in.

8. OUTLINE DIMENSIONAL DRAWINGS

8.3 Connector

Signal connector

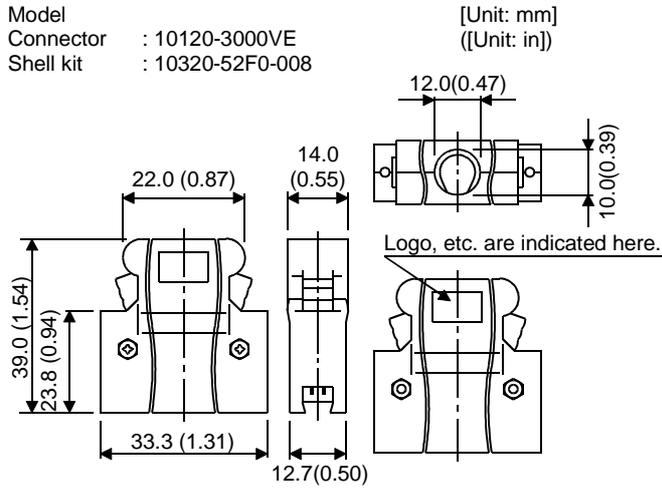
<3M>

(a) Soldered type

Model

Connector : 10120-3000VE

Shell kit : 10320-52F0-008

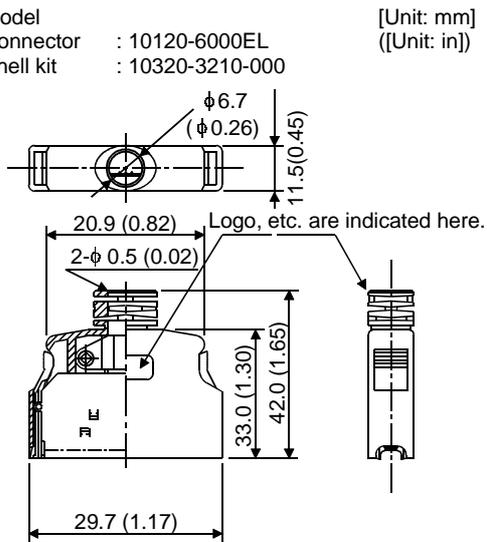


(b) Threaded type

Model

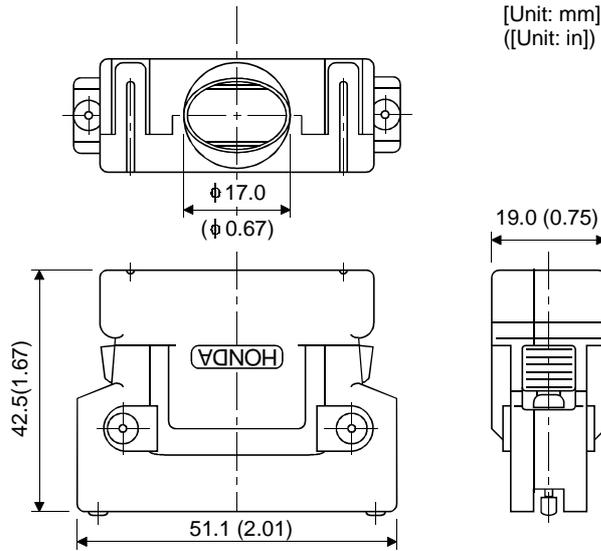
Connector : 10120-6000EL

Shell kit : 10320-3210-000



8. OUTLINE DIMENSIONAL DRAWINGS

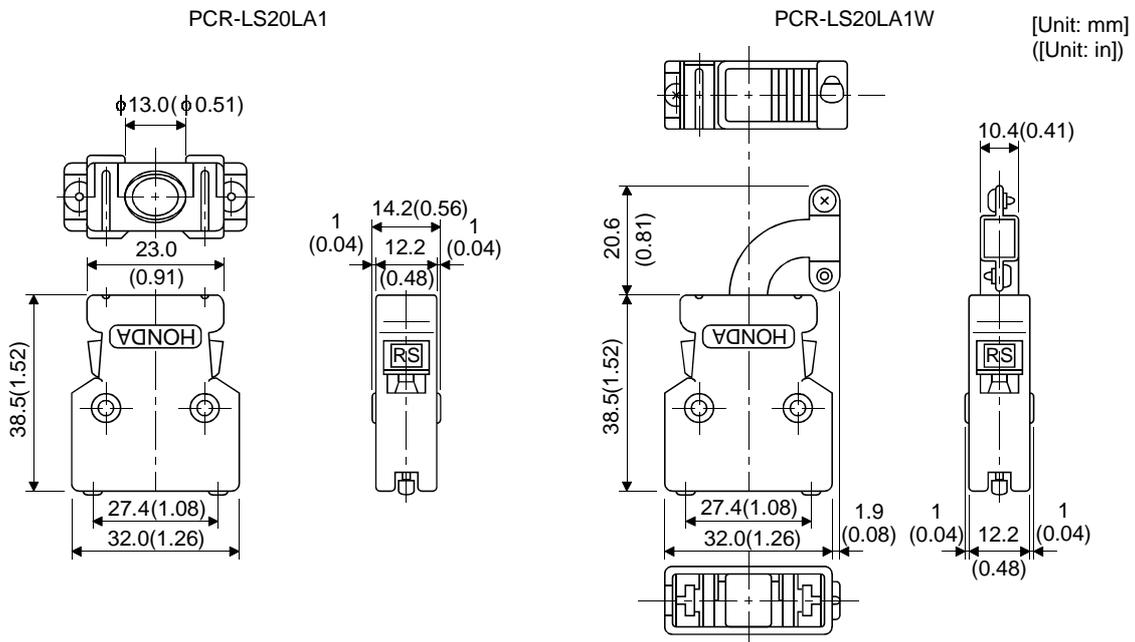
<Honda Tsushin Kogyo make>



Number of Pins	Model	
	Connector	Case
50	PCR-S50FS(soldering type)	PCR-LS50LA1
	PCR-S50F(insulation displacement type)	

Crimping terminal: FHAT-002A

Note. PCR-S50F is not an option and is to be supplied by the customer



Number of Pins	Model	
	Connector	Case
20	PCR-S20FS(soldering type)	PCR-LS20LA1
	PCR-S20F(insulation displacement type)	PCR-LS20LA1W

Crimping terminal: FHAT-002A

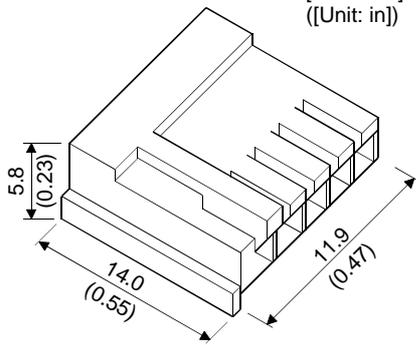
Note. PCR-S20F and PCR-LS20LA1W are not options and are to be supplied by the customer.

8. OUTLINE DIMENSIONAL DRAWINGS

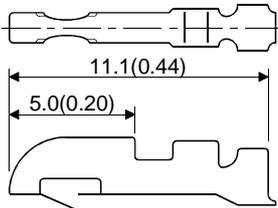
<Tyco Electronics>

Housing Model: 171822-4

[Unit: mm]
([Unit: in])



- Contactor Model: 170262-2(chain type) Applicable wire range
- 170204-2(loose type) AWG 30-26
- [Unit: mm] (0.05 to 0.15mm²)
- ([Unit: in]) Contactor caulking hand tool
- Model: 722561-1



9. CHARACTERISTICS

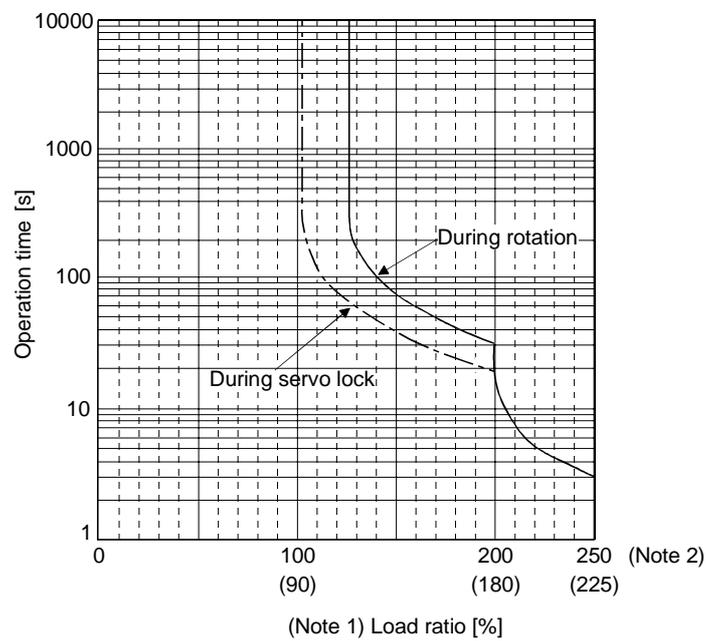
9. CHARACTERISTICS

9.1 Overload protection characteristics

An electronic thermal relay is built in the servo amplifier and converter unit to protect the servo motor, servo amplifier and converter unit from overloads.

Overload 1 alarm (A.50) occurs if overload operation performed is above the electronic thermal relay protection curve shown below. Overload 2 alarm (A.51) occurs if the maximum current flow continuously for several seconds due to machine collision, etc. Use the equipment on the left-hand side area of the continuous or broken line in the graph.

It is recommended to use the machine which generates unbalanced torque, e.g. a vertical lift application, so that the unbalanced torque is not more than 70% of the rated torque.



Note 1. If operation that generates torque more than 100% of the rating is performed with an abnormally high frequency in a servo motor stop status (servo lock status) or in a 30r/min or less low-speed operation status, the servo amplifier may fail even when the electronic thermal relay protection is not activated.

2. The values within parentheses in the graph are those in the low acoustic noise mode of the MELSERVO-H series.

Fig 9.1 Electronic thermal relay protection characteristics

9. CHARACTERISTICS

9.2 Power supply equipment capacity and generated loss

(1) Power supply equipment capacity and generated loss

Table 8.1 indicates the generated loss and power supply capacity under rated load per combination of the converter unit and servo amplifier. When the servo motors is run at less than the maximum speed, the power supply equipment capacity is lower than the value in the table but the heat generated does not change.

Since the servo motor requires 2 to 2.5 times greater instantaneous power for acceleration, use the power supply which ensures that the voltage lies within the permissible voltage fluctuation at the main circuit power supply terminals (L1, L2, L3) of the converter unit. The power supply equipment capacity changes with the power supply impedance.

The actually generated heat falls within the ranges at rated torque and at zero torque according to the frequencies of use during operation. When designing an enclosed control box, use the values in the table, considering the worst operating conditions. The generated heat in Table 8.1 does not include heat produced during regeneration.

Table 8.1 Power Supply Capacity and Generated Heat Per Servo Amplifier at Rated Output

Servo Amplifier	Converter Unit	Power Supply Capacity [kVA]		(Note) Servo Amplifier-Generated Heat[W]		Area Required for Heat Dissipation	
		Power factor improving DC reactor is not used	Power factor improving DC reactor is used	At rated torque	At zero torque	[m ²]	[ft ²]
MR-JS-30KA/B MR-H30KAN/BN	MH-HP30KA	48	40	1650 (1100+550)	60 (30+30)	24.1	259.4
MR-JS-37KA/B MR-H37KAN/BN		59	49	1650 (1310+342)	60 (30+30)	30.6	329.4
MR-JS-30KA4/B4 MR-H30KAN4/BN4	MH-HP55KA4	48	40	1290 (1010+280)	60 (30+30)	24.1	259.4
MR-JS-37KA4/B4 MR-H37KAN4/BN4		59	49	1650 (1310+342)	60 (30+30)	30.6	329.4
MR-JS-47KA4/B4 MR-H47KAN4/BN4		71	59	1810 (1370+440)	60 (30+30)	33.5	360.6
MR-JS-55KA4/B4 MR-H55KAN4/BN4		87	72	2190 (1690+500)	60 (30+30)	40.5	435.9

Note. The heat generated by the servo amplifier is indicated in the left term within the parentheses, and the heat generated by the converter unit in the right term.

9. CHARACTERISTICS

(2) Heat dissipation area of enclosed control box

When setting the temperature inside the enclosed control box (hereafter referred to as the control box) which will contain the converter unit and servo amplifier, factor in the allowance of about 5°C (41°F) relative to the maximum operating environmental condition temperature of 55°C (131°F) so that it is a maximum of 10°C (50°F) higher than the ambient temperature of 40°C (104°F). Use Expression (9.1) to calculate the heat dissipation area of the control box.

$$A = \frac{P}{K \cdot \Delta T} \dots\dots\dots (9.1)$$

where, A : Heat dissipation area [m²]
 P : Loss generated in the control box [W]
 ΔT : Difference between internal and ambient temperatures [°C]
 K : Heat dissipation coefficient [5 to 6]

When calculating the heat dissipation area with Equation 9.1, assume that P is the sum of all losses generated in the enclosure. Refer to Table 9.1 for heat generated by the servo amplifier. "A" indicates the effective area for heat dissipation, but if the enclosure is directly installed on an insulated wall, that extra amount must be added to the enclosure's surface area. The required heat dissipation area will vary with the conditions in the enclosure. If convection in the enclosure is poor and heat builds up, effective heat dissipation will not be possible. Therefore, arrangement of the equipment in the enclosure and the use of a fan should be considered. Table 8.1 lists the enclosure dissipation area for each servo amplifier when the servo amplifier is operated at the ambient temperature of 40°C (104°F) under rated load.

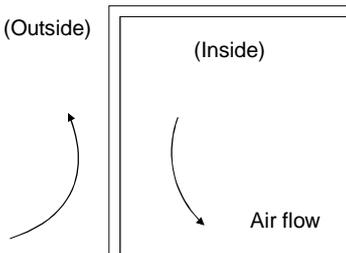


Fig 9.2 Temperature Distribution in Enclosure

When air flows along the outer wall of the enclosure, effective heat exchange will be possible, because the temperature slope inside and outside the enclosure will be steeper.

(3) Fitting of the servo amplifier

When mounted with the heat sink outside mounting attachment (option), the servo amplifier can dissipate generated loss directly to the outside of a control box. This method can reduce the heat dissipation area of the control box since 45 to 55% of the generated loss given in Table 9.1 is dissipated to the outside of the enclosure. For details of the heat sink outside mounting attachment, refer to Section 10.3.2.

9. CHARACTERISTICS

9.3 Dynamic brake characteristics

Fig. 9.3 shows the pattern in which the servo motor comes to a stop when the dynamic brake is operated. Use Equation 9.2 to calculate an approximate coasting distance to a stop. The dynamic brake time constant t varies with the servo motor and machine operation speeds. (Refer to Fig. 9.4. Please contact us for the servo motor not indicated.)

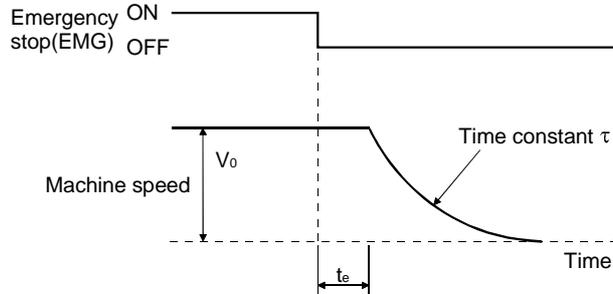


Fig 9.3 Dynamic Brake Operation Diagram

$$L_{\max} = \frac{V_0}{60} \cdot \left\{ t_e + \tau \left[1 + \frac{J_L}{J_M} \right] \right\} \dots \dots \dots (9.2)$$

- L max : Maximum coasting distance..... [mm][in]
 - V0 : Machine rapid feedrate..... [mm/min][in/min]
 - JM : Servo motor inertial moment [kg · cm²][oz · in²]
 - JL : Load inertia moment converted into equivalent value on servo motor shaft ... [kg · cm²][oz · in²]
 - τ : Brake time constant..... [s]
 - t_e : Delay time of control section..... [s]
- (There is internal relay delay time of about 30ms.)

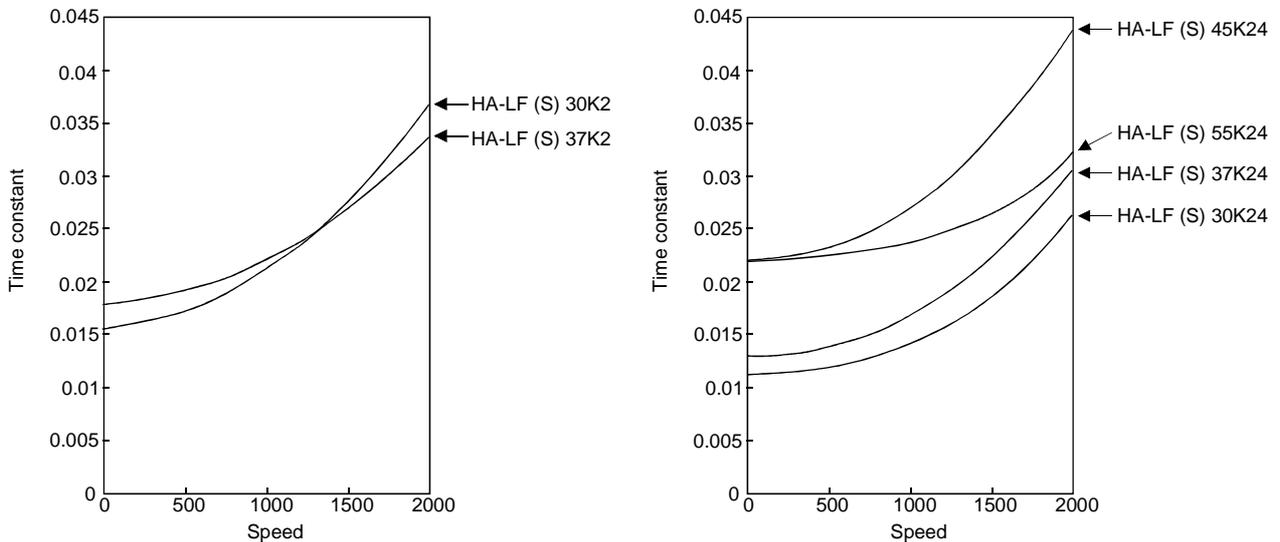


Fig 8.3 Dynamic Brake

If the dynamic brake is operated at more than 10 times as large as the ratio of load inertia moment to servo motor inertia moment, the brake resistor of the dynamic brake may burn out. If the value is exceeded, contacts us.

10. OPTIONS AND AUXILIARY EQUIPMENT

10. OPTIONS AND AUXILIARY EQUIPMENT

 WARNING	<ul style="list-style-type: none"> Before connecting any option or auxiliary equipment, make sure that the charge lamp is off more than 20 minutes after power-off, then confirm the voltage with a tester or the like. Otherwise, you may get an electric shock.
--	--

 CAUTION	<ul style="list-style-type: none"> Use the specified auxiliary equipment and options. Unspecified ones may lead to a fault or fire.
--	--

10.1 200V class dedicated options

10.1.1 Regenerative brake option (200V class)

 CAUTION	<ul style="list-style-type: none"> The specified combinations of regenerative brake options and servo amplifiers may only be used. Otherwise, a fire may occur.
--	--

(1) Combination and regenerative power

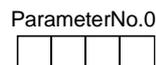
The regenerative power values in the table are the regenerative power of the resistor and are not the rated power.

Servo Amplifier	Converter unit	Regenerative Power [W]	
		MR-RB139 (1.3Ω)	(Note) Three MR-RB137 (1.3Ω) in parallel
MR-J2S-30KA/B MR-H30KAN/BN	MR-HP30KA	1300	3900
MR-J2S-37KA/B MR-H37KAN/BN			

Note. The composite resistor value of three options is 1.3 Ω. The resistor value of one option is 4 Ω.

(2) Parameter setting

When using the regenerative brake option, set the parameter of the converter unit. Match parameter No. 0 to the regenerative brake option used.



- Regenerative brake option selection
- 0: Not used
 - 1: MR-RB139
 - 2: MR-RB137(3 pcs.)

(3) Regenerative loss of servo amplifier and servo motor

Servo Amplifier	Inverse Efficiency [%]	C Charge [J]
MR-J2S-30KA/B MR-H30KAN/BN	90	390
MR-J2S-37KA/B MR-H37KAN/BN		

10. OPTIONS AND AUXILIARY EQUIPMENT

(4) Connection of the regenerative brake option

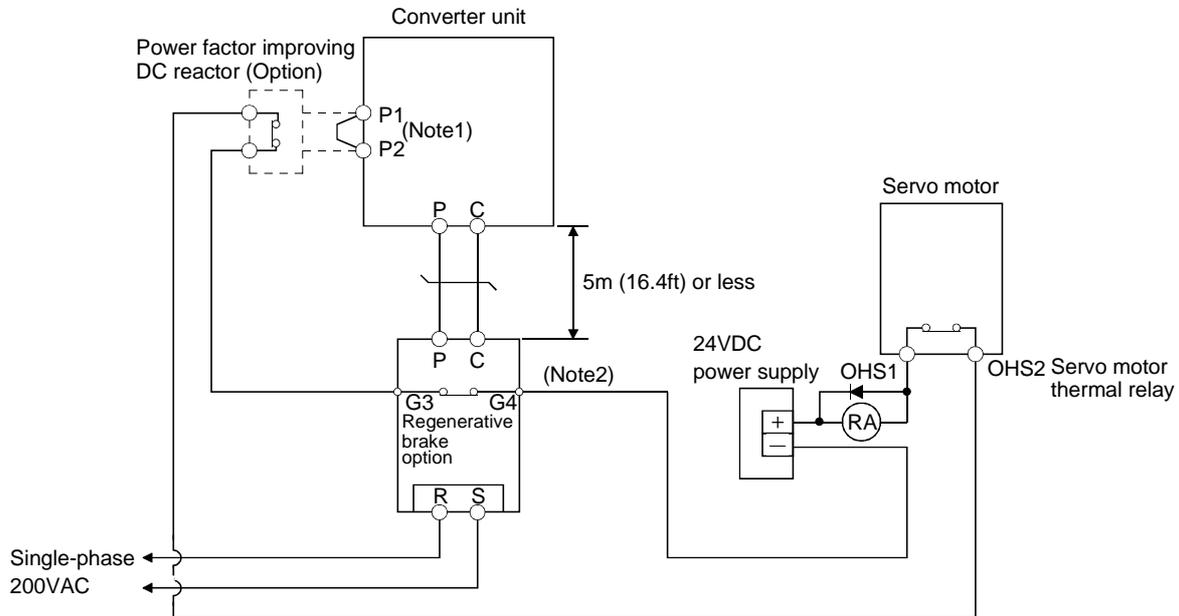
Always supply single-phase 200VAC to the cooling fan. The cooling fan specifications are as follows.

Item	Specifications
Voltage, frequency	Single-phase 200VAC, 50/60Hz
Power consumption [W]	20(50Hz)/18(60Hz)

The regenerative brake option generates heat of 100°C higher than the ambient temperature. Fully consider heat dissipation, installation position, used wires, etc. to place the option. For wiring, use flame-resistant wires or make the wires flame-resistant and keep them away from the regenerative brake option. The G3 and G4 terminals act as a thermal sensor. G3-G4 are opened when the regenerative brake option overheats abnormally.

Always twist the wires for connection with the converter unit and connect the wires within the overall distance of 5m.

(a) MR-RB139



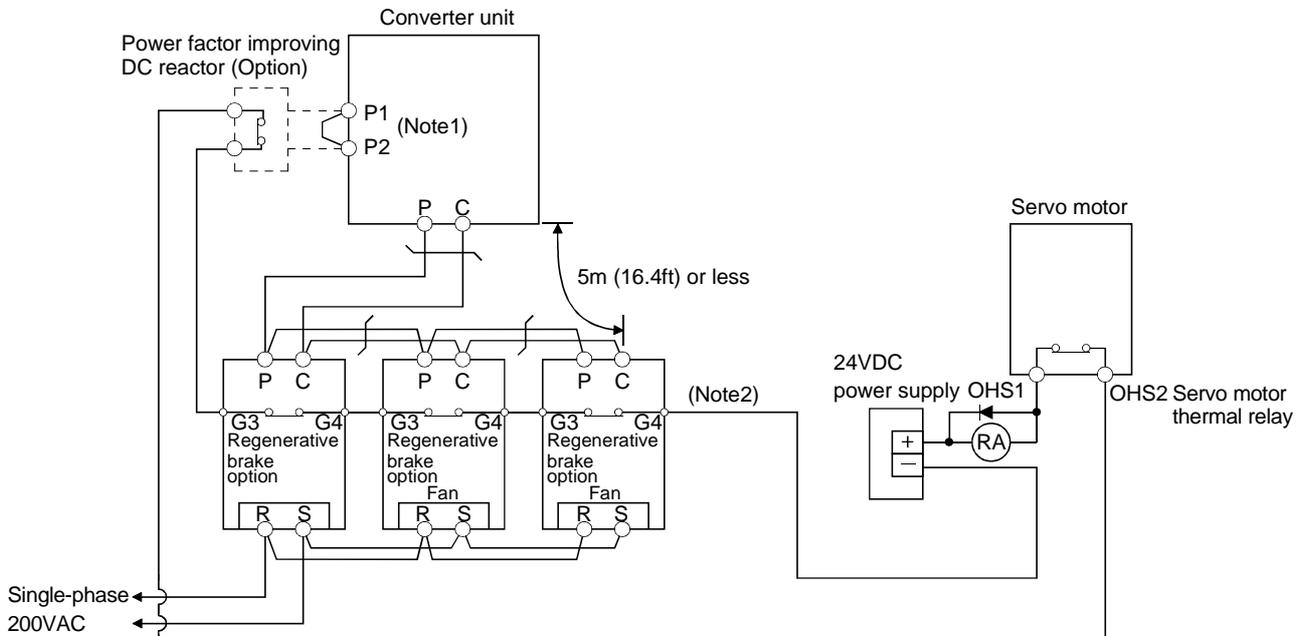
Note 1. When using the Power factor improving DC reactor, remove the short bar across P1-P2.

2. G3-G4 contact specifications
- Maximum voltage: 120V AC/DC
 - Maximum current: 0.5V/4.8VDC
 - Maximum capacity: 2.4VA

10. OPTIONS AND AUXILIARY EQUIPMENT

(b) MR-RB137

POINT
<ul style="list-style-type: none"> Three MR-RB137's are required per servo amplifier. Please purchase three MR-RB137's.

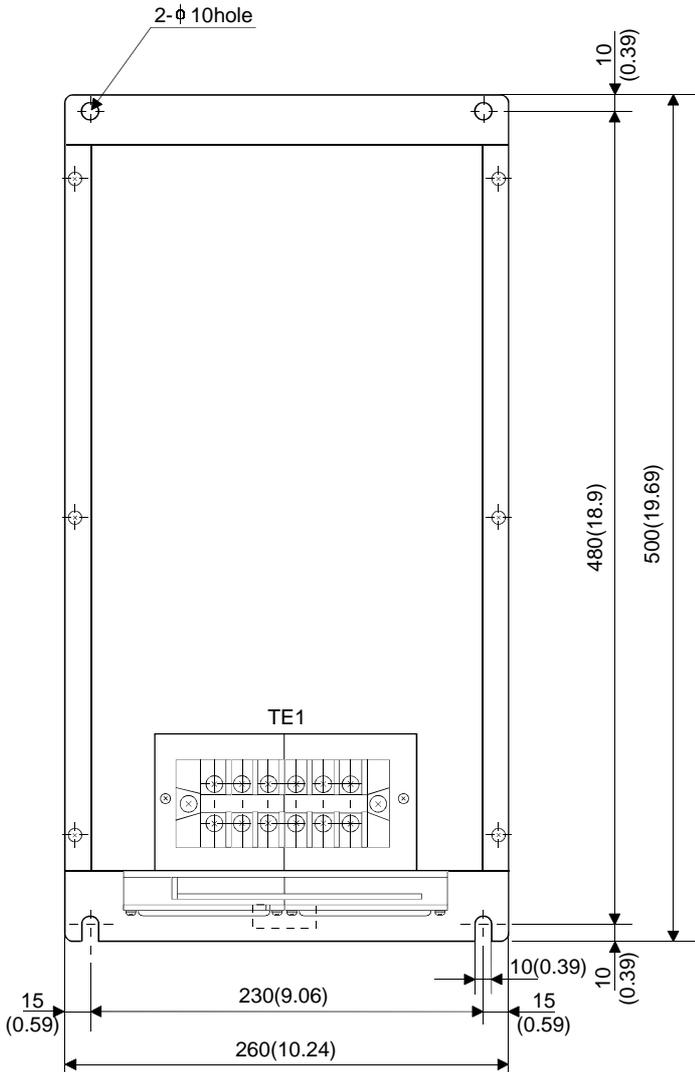


Note 1. When using the Power factor improving DC reactor, remove the short bar across P1-P2.

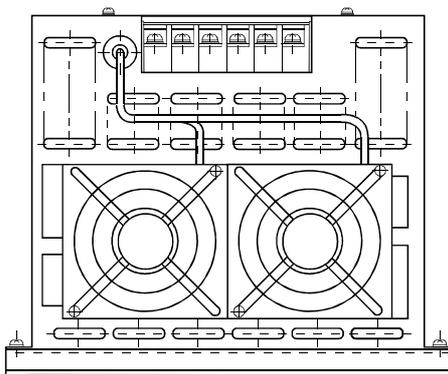
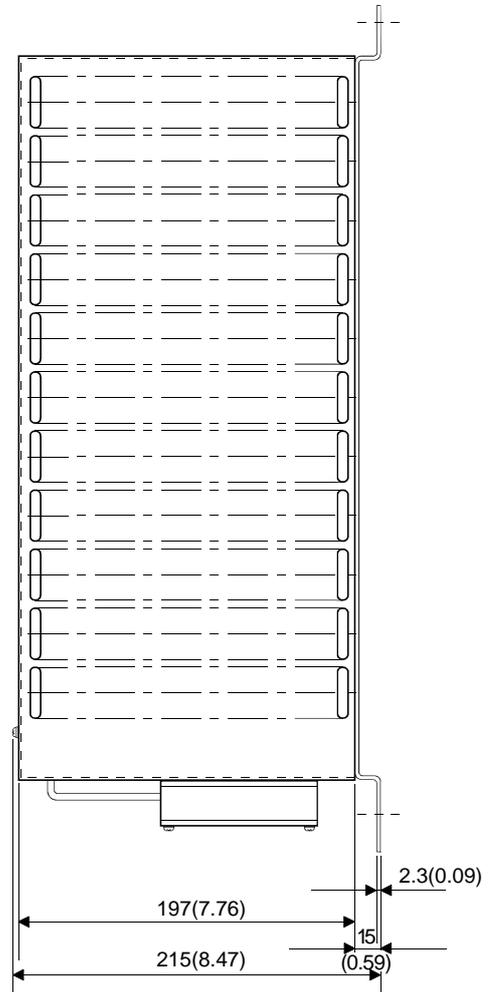
- G3-G4 contact specifications
 - Maximum voltage: 120V AC/DC
 - Maximum current: 0.5V/4.8VDC
 - Maximum capacity: 2.4VA

10. OPTIONS AND AUXILIARY EQUIPMENT

(5) Outline dimension drawings



[Unit: mm]
[Unit: in]



Regenerative Brake Option	Mass [kg (lb)]
MR-RB139	10(22.05)
MR-RB137	11(24.25)

• Terminal block signal layout

TE1

R	S	G4	G3	C	P
---	---	----	----	---	---

Terminal screw: M5

Tightening torque: 2.0[N·m] (17.7[lb·in])

• Mounting screw

Screw size: M8

Tightening torque: 13.2[N·m] (117[lb·in])

10. OPTIONS AND AUXILIARY EQUIPMENT

10.1.2 External dynamic brake (200V class)

POINT
<ul style="list-style-type: none"> ▪ Configure up a sequence which switches off the contact of the brake unit after (or as soon as) it has turned off the servo on (son) at a power failure or failure. ▪ For the braking time taken when the dynamic brake is operated, refer to Section 9.3. ▪ The brake unit is rated for a short duration. Do not use it for high duty. ▪ The specifications of the input power supply for external dynamic brake are the same as those of the converter unit control circuit power supply.

(1) Selection of dynamic brake

The dynamic brake is designed to bring the servo motor to a sudden stop when a power failure occurs or the protective circuit is activated.

The corresponding parameter value must be set to use the external dynamic brake. For parameter settings, refer to the External dynamic brake section of the corresponding Servo Amplifier Instruction Manual since they are the same as those of the 11k to 22kW servo amplifiers.

Servo Amplifier	Converter unit	Dynamic Brake
MR-J2S-30KA/B MR-H30KAN/BN	MR-HP30KA	DBU-37K
MR-J2S-37KA/B MR-H37KAN/BN		

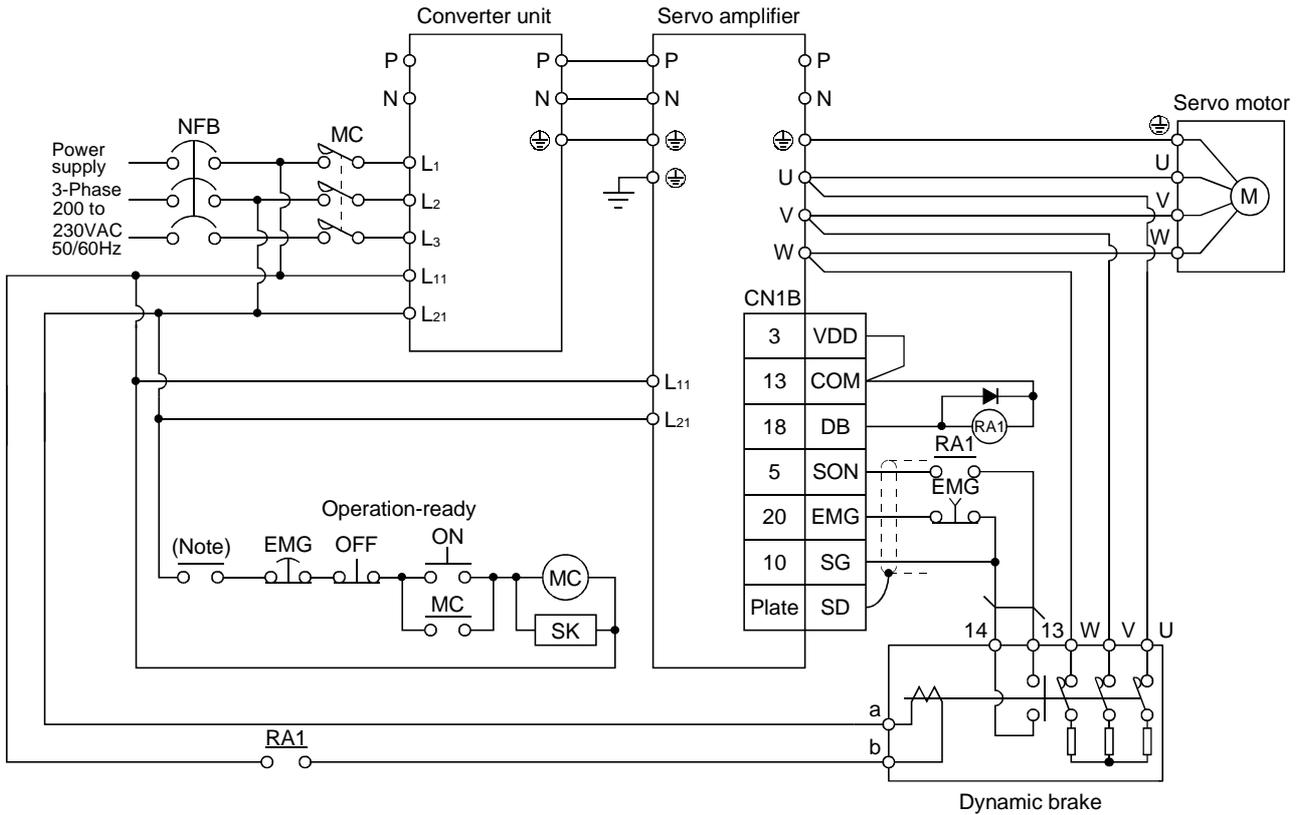
(2) Connection example

Use the following wires to connect the dynamic brake.

Dynamic Brake	Wire[mm ²]	
	a · b	U · V · W
DBU-37K	2	14

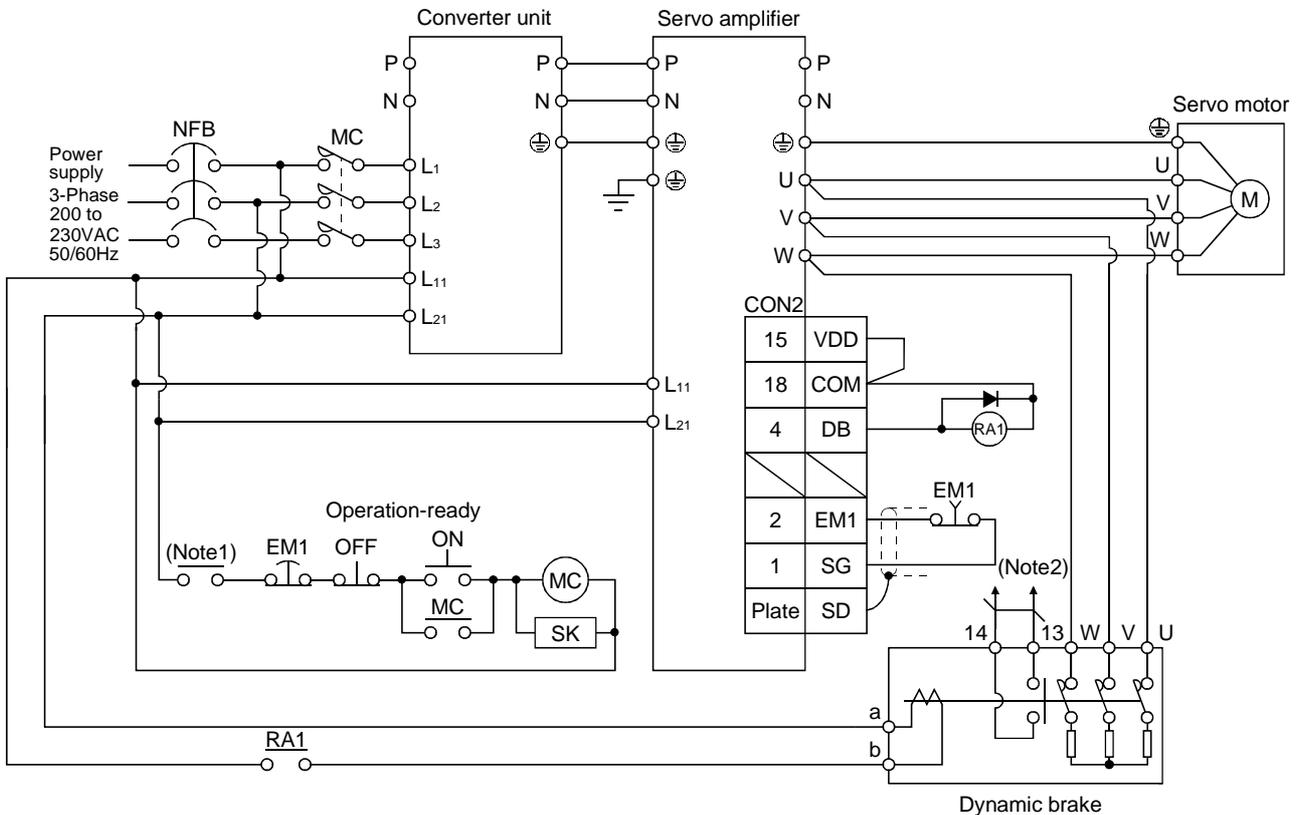
10. OPTIONS AND AUXILIARY EQUIPMENT

(a) MR-J2S-□A



Note. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

(b) MR-J2S-□B

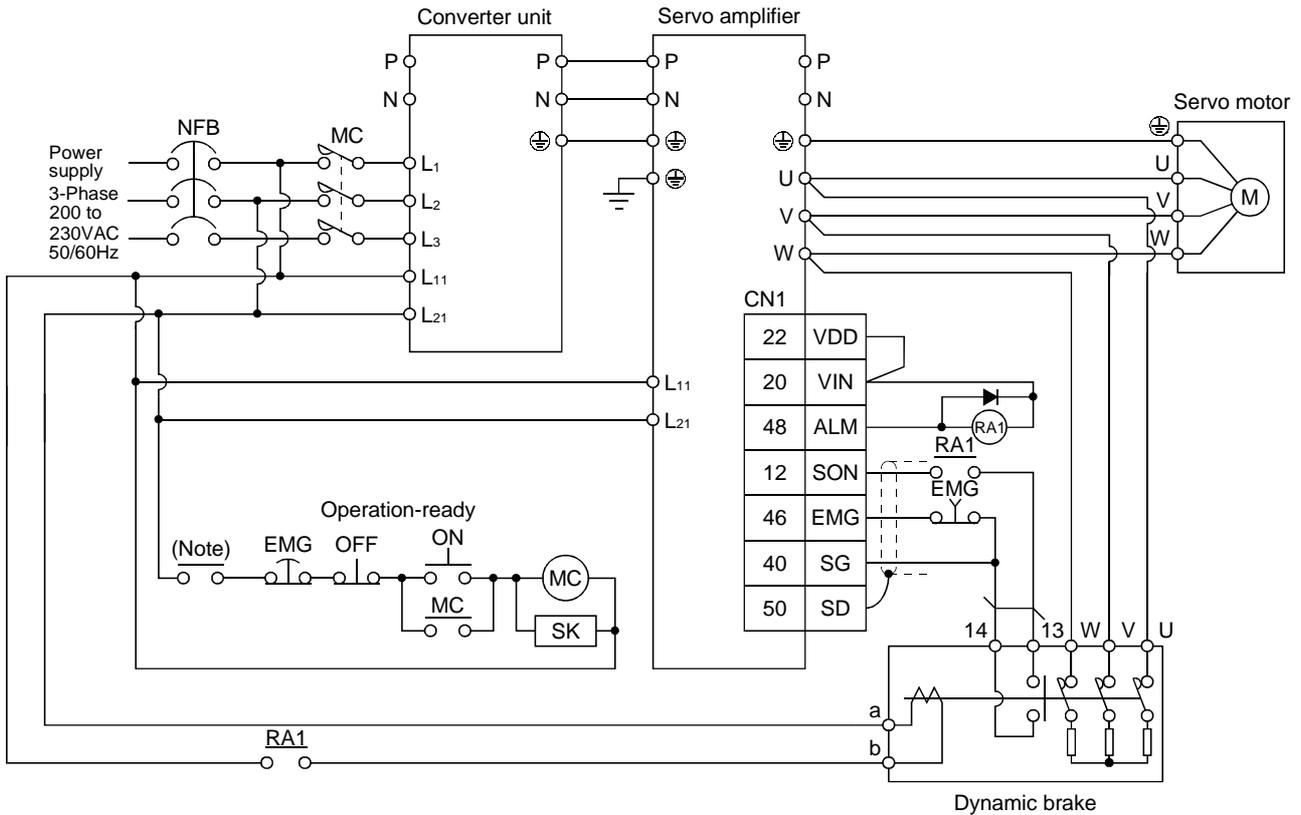


Note 1. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

2. Terminals 13, 14 are N/O contact outputs. When the dynamic brake has stuck, terminals 13, 14 are opened. Therefore, configure up the circuit to prevent servo-on in the external sequence.

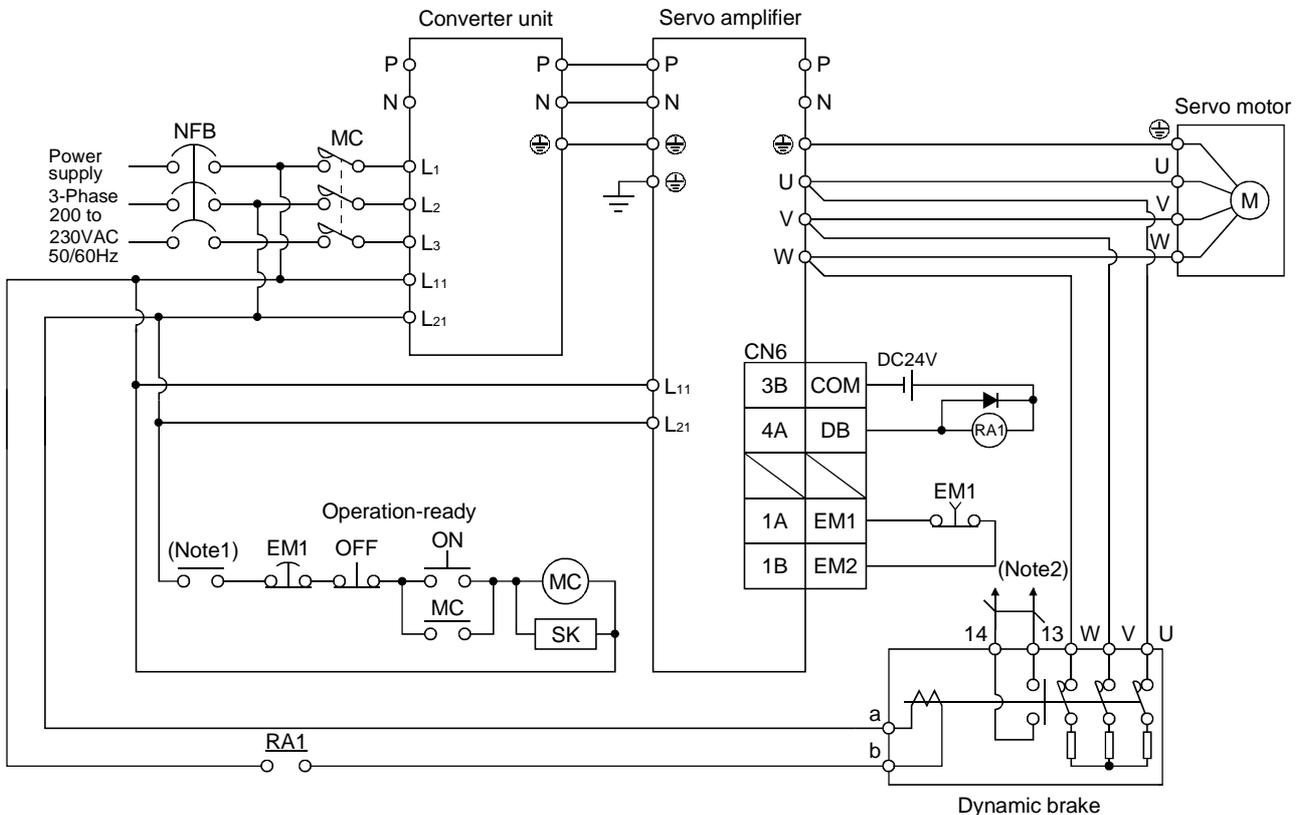
10. OPTIONS AND AUXILIARY EQUIPMENT

(c) MR-H□AN



Note. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

(d) MR-H□BN



Note 1. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

2. Terminals 13, 14 are N/O contact outputs. When the dynamic brake has stuck, terminals 13, 14 are opened. Therefore, configure up the circuit to prevent servo-on in the external sequence.

10. OPTIONS AND AUXILIARY EQUIPMENT

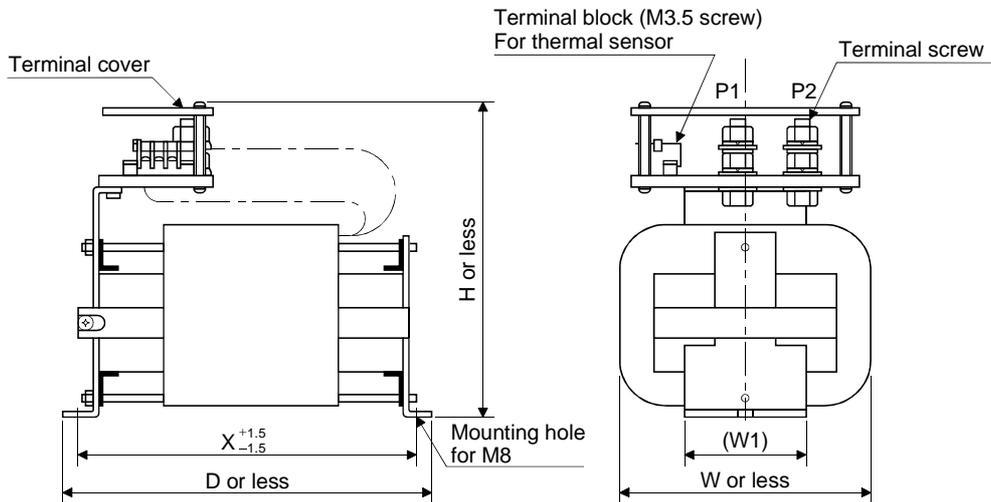
10.1.3 No-fuse breakers, magnetic contactors (200V class)

Always use one no-fuse brakers and one magnetic contactor with one servo amplifier.

Servo Amplifier	Converter unit	No-Fuse Breaker		Magnetic Contactor
		Power factor improving DC reactor is not used	Power factor improving DC reactor is used	
MR-JS-30KA/B MR-H30KAN/BN	MR-HP30KA	400A frame 250A	225A frame 225A	S-K150
MR-JS-37KA/B MR-H37KAN/BN		400A frame 300A	225A frame 300A	Error! Not a valid link.

10.1.4 Power factor improving DC reactor (200V class)

Servo Amplifier	Converter unit	Power factor improving DC reactor
MR-JS-30KA/B MR-H30KAN/BN	MR-HP30KA	MR-DCL30K
MR-JS-37KA/B MR-H37KAN/BN		MR-DCL37K

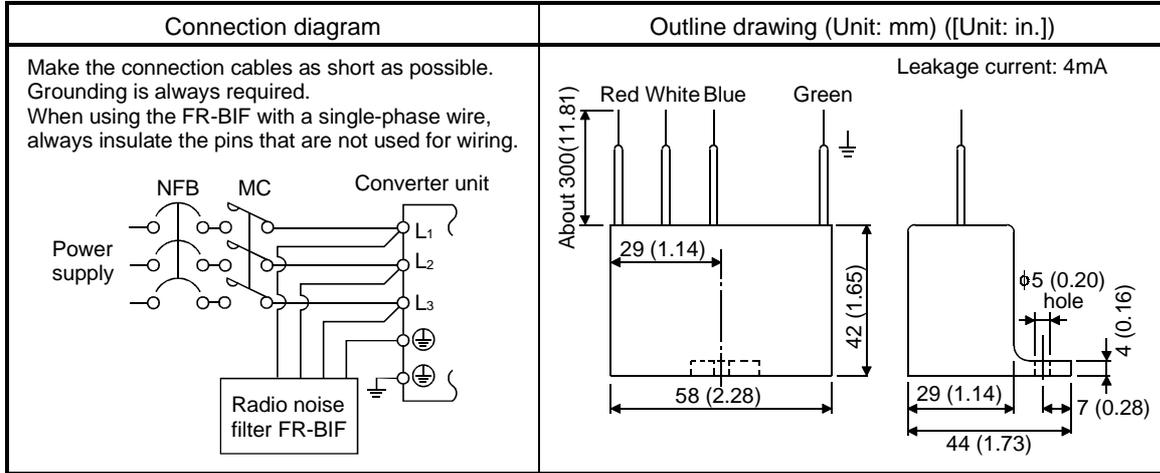


Model	W	D	H	W1	X	Terminal Screw	Mass [kg (lb)]
MR-DCL30K	135	255	215	80	232	M12	Approx. 9.5 (20.93)
MR-DCL37K	(5.32)	(10.0)	(8.47)	(3.15)	(9.13)		

10. OPTIONS AND AUXILIARY EQUIPMENT

10.1.5 Radio noise filter (200V class)

Radio noise filter (FR-BIF) is effective in suppressing noises radiated from the power supply side of the servo amplifier especially in 10MHz and lower radio frequency bands. The radio noise filter is designed for the input only.



10. OPTIONS AND AUXILIARY EQUIPMENT

10.2 400V class dedicated options

10.2.1 Regenerative brake option (400V class)



CAUTION

The specified combinations of regenerative brake options and servo amplifiers may only be used. Otherwise, a fire may occur.

(1) Combination and regenerative power

The regenerative power values in the table are the regenerative power of the resistor and are not the rated power.

Servo Amplifier	Converter unit	Regenerative Power [W]	
		MR-RB136-4 (5Ω)	(Note) Three MR-RB138-4 (5Ω) in parallel
MR-JS-30KA4/B4 MR-H30KAN4/BN4	MR-HP55KA4	1300	3900
MR-JS-37KA4/B4 MR-H37KAN4/BN4			
MR-JS-45KA4/B4 MR-H45KAN4/BN4			
MR-JS-55KA4/B4 MR-H55KAN4/BN4			

Note. The composite resistor value of three options is 5 Ω.

(2) Parameter setting

When using the regenerative brake option, set the parameter of the converter unit. Match parameter No. 0 to the regenerative brake option used.

ParameterNo.0

--	--	--	--

Regenerative brake option selection

- 0: Not used
- 1: MR-RB136-4
- 2: MR-RB138-4(3 pcs.)

(3) Regenerative loss of servo amplifier and servo motor

Servo Amplifier	Inverse Efficiency [%]	C Charge [J]
MR-JS-30KA4/B4 MR-H30KAN4/BN4	90	310
MR-JS-37KA4/B4 MR-H37KAN4/BN4	90	370
MR-JS-45KA4/B4 MR-H45KAN4/BN4	90	450
MR-JS-55KA4/B4 MR-H55KAN4/BN4	90	450

10. OPTIONS AND AUXILIARY EQUIPMENT

(4) Connection of the regenerative brake option

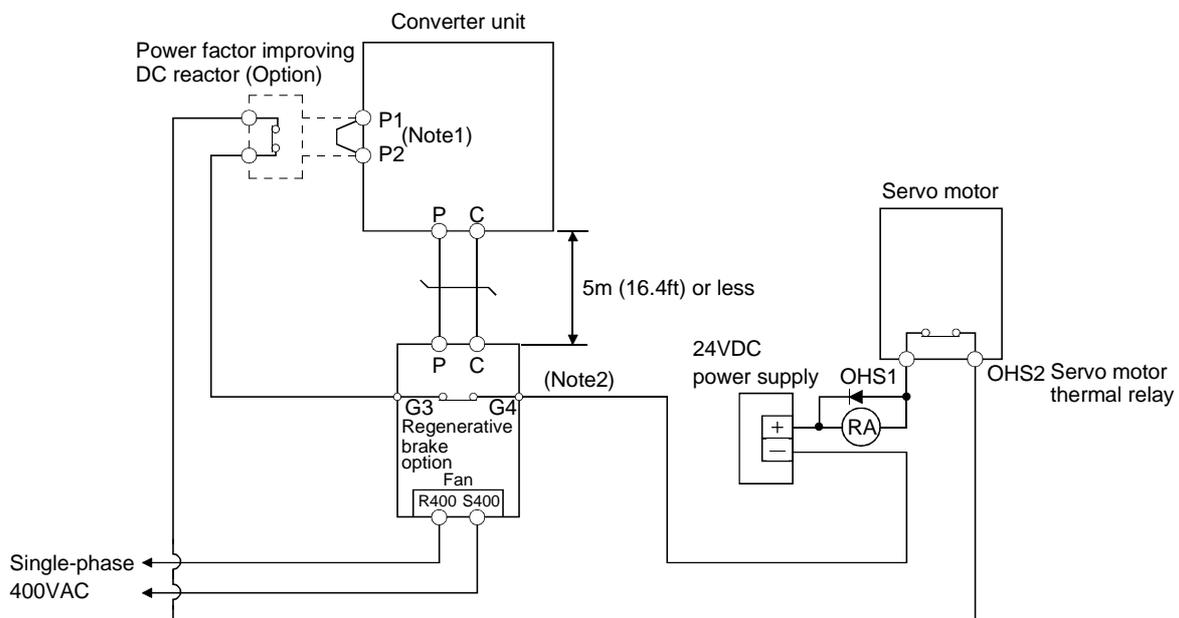
Always supply single-phase 400VAC to the cooling fan. The cooling fan specifications are as follows.

Item	Specifications
Voltage, frequency	Single-phase 400VAC, 50/60Hz
Power consumption [W]	20(50Hz)/18(60Hz)

The regenerative brake option generates heat of 100°C higher than the ambient temperature. Fully consider heat dissipation, installation position, used wires, etc. to place the option. For wiring, use flame-resistant wires or make the wires flame-resistant and keep them away from the regenerative brake option. The G3 and G4 terminals act as a thermal sensor. G3-G4 are opened when the regenerative brake option overheats abnormally.

Always twist the wires for connection with the converter unit and connect the wires within the overall distance of 5m.

(a) MR-RB136-4



Note 1. When using the Power factor improving DC reactor, remove the short bar across P1-P2.

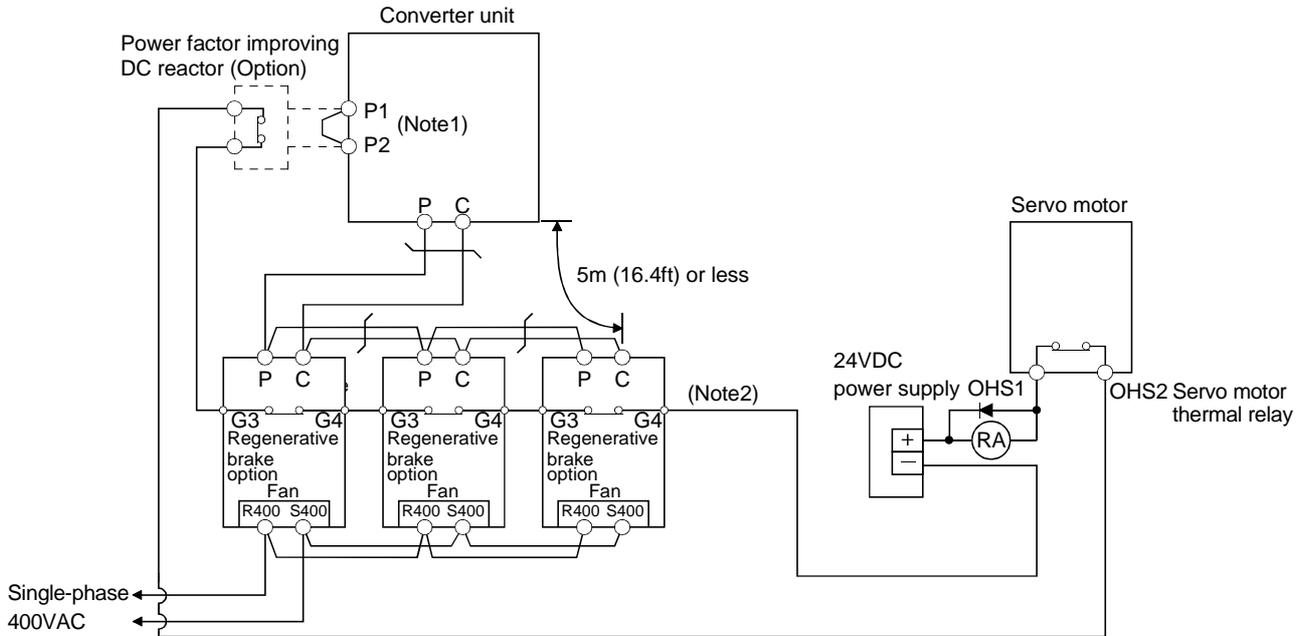
2. G3-G4 contact specifications
- Maximum voltage: 120V AC/DC
 - Maximum current: 0.5V/4.8VDC
 - Maximum capacity: 2.4VA

10. OPTIONS AND AUXILIARY EQUIPMENT

(b) MR-RB138-4

POINT

- Three MR-RB138-4's are required per servo amplifier. Please purchase three MR-RB138-4's.

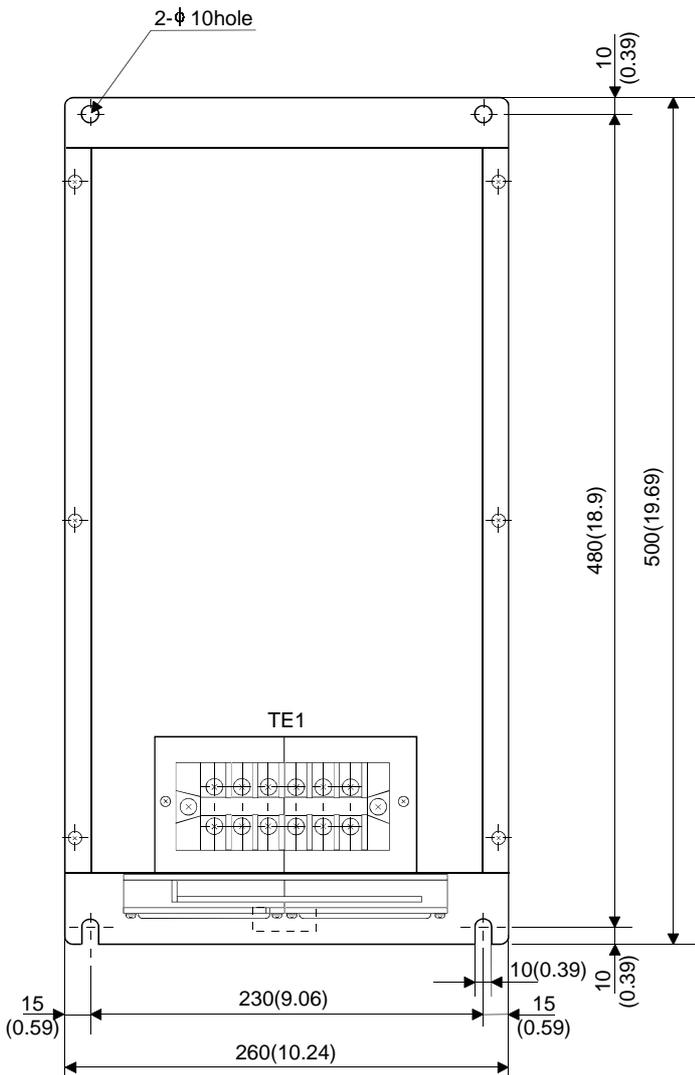


Note 1. When using the Power factor improving DC reactor, remove the short bar across P1-P2.

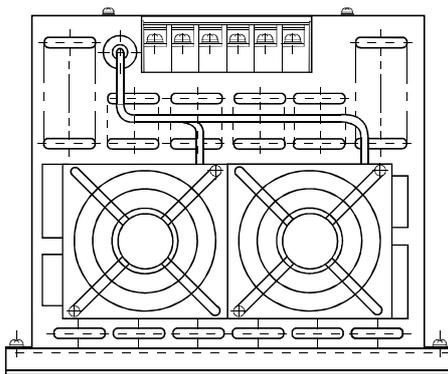
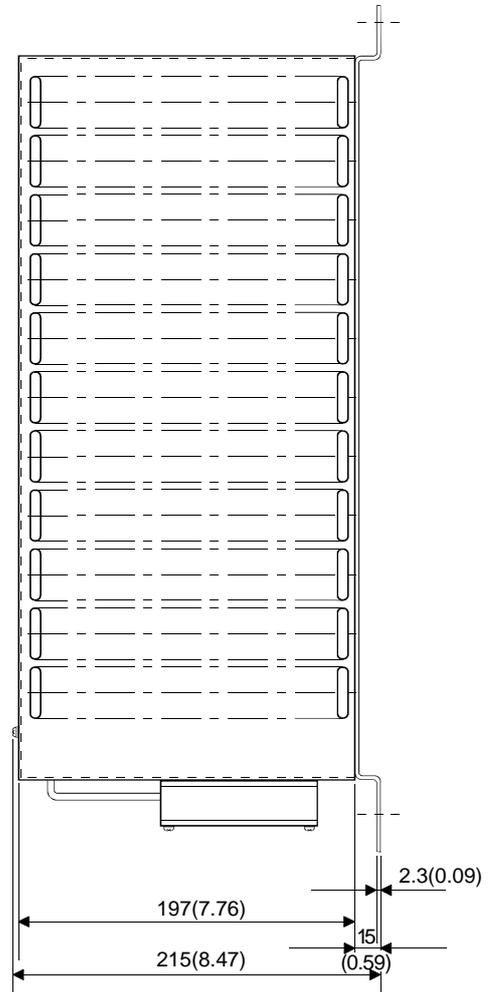
2. G3-G4 contact specifications
 - Maximum voltage: 120V AC/DC
 - Maximum current: 0.5V/4.8VDC
 - Maximum capacity: 2.4VA

10. OPTIONS AND AUXILIARY EQUIPMENT

(5) Outline dimension drawings



[Unit: mm]
[Unit: in]



Regenerative Brake Option	Mass [kg (lb)]
MR-RB136-4	10(22.05)
MR-RB138-4	11(24.25)

• Terminal block signal layout

TE1

R400	S400	G4	G3	C	P
------	------	----	----	---	---

Terminal screw: M5

Tightening torque: 2.0[N·m] (17.7[lb·in])

• Mounting screw

Screw size: M8

Tightening torque: 13.2[N·m] (117[lb·in])

10. OPTIONS AND AUXILIARY EQUIPMENT

10.2.2 External dynamic brake (400V class)

POINT
<ul style="list-style-type: none"> ▪ Configure up a sequence which switches off the contact of the brake unit after (or as soon as) it has turned off the servo on (son) at a power failure or failure. ▪ For the braking time taken when the dynamic brake is operated, refer to Section 9.3. ▪ The brake unit is rated for a short duration. Do not use it for high duty. ▪ The specifications of the input power supply for external dynamic brake are the same as those of the converter unit control circuit power supply.

(1) Selection of dynamic brake

The dynamic brake is designed to bring the servo motor to a sudden stop when a power failure occurs or the protective circuit is activated.

The corresponding parameter value must be set to use the external dynamic brake. For parameter settings, refer to the External dynamic brake section of the corresponding Servo Amplifier Instruction Manual since they are the same as those of the 11k to 22kW servo amplifiers.

Servo Amplifier	Converter unit	Dynamic Brake
MR-JS-30KA4/B4 MR-H30KAN4/BN4	MR-HP55KA4	DBU-55K-4
MR-JS-37KA4/B4 MR-H37KAN4/BN4		
MR-JS-45KA4/B4 MR-H45KAN4/BN4		
MR-JS-55KA4/B4 MR-H55KAN4/BN4		

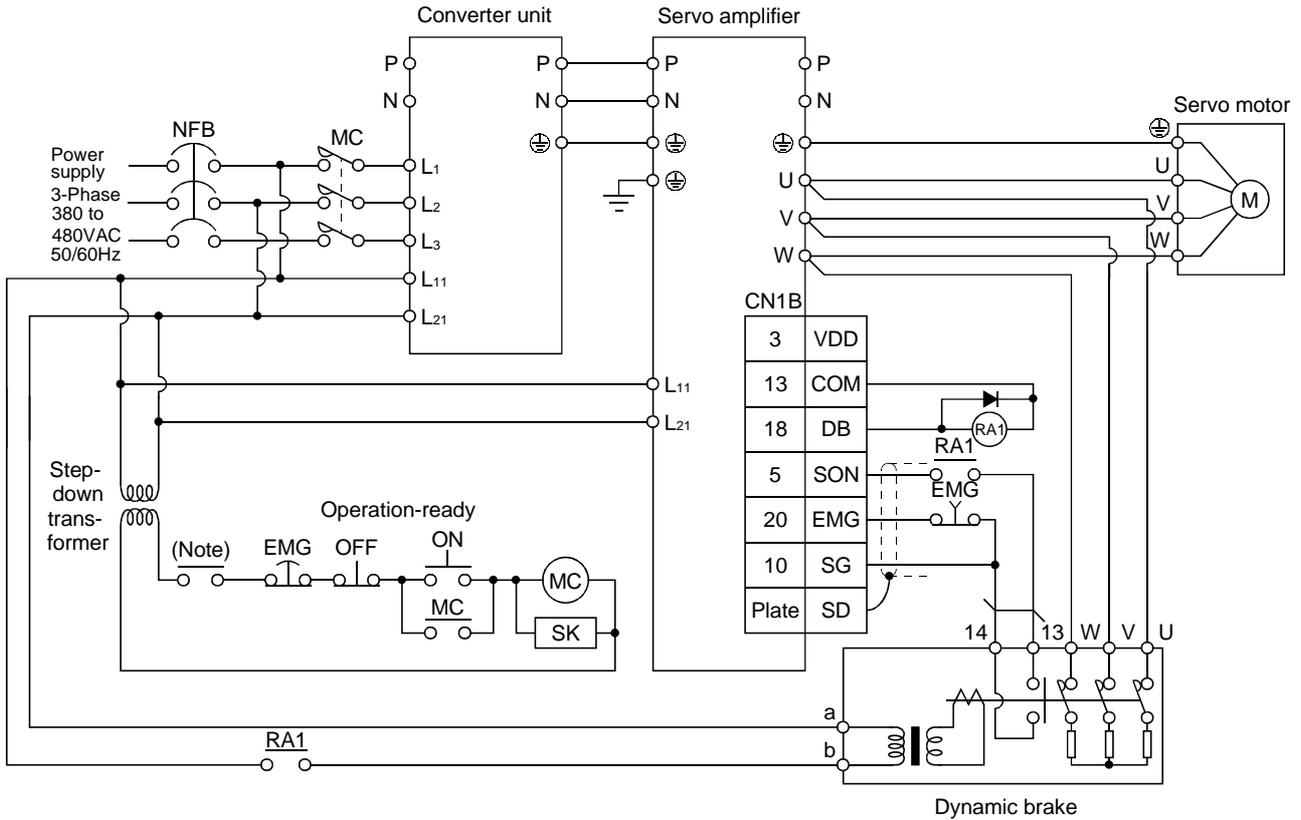
(2) Connection example

Use the following wires to connect the dynamic brake.

Dynamic Brake	Wire[mm ²]	
	a · b	U · V · W
DBU-55K-4	2	14

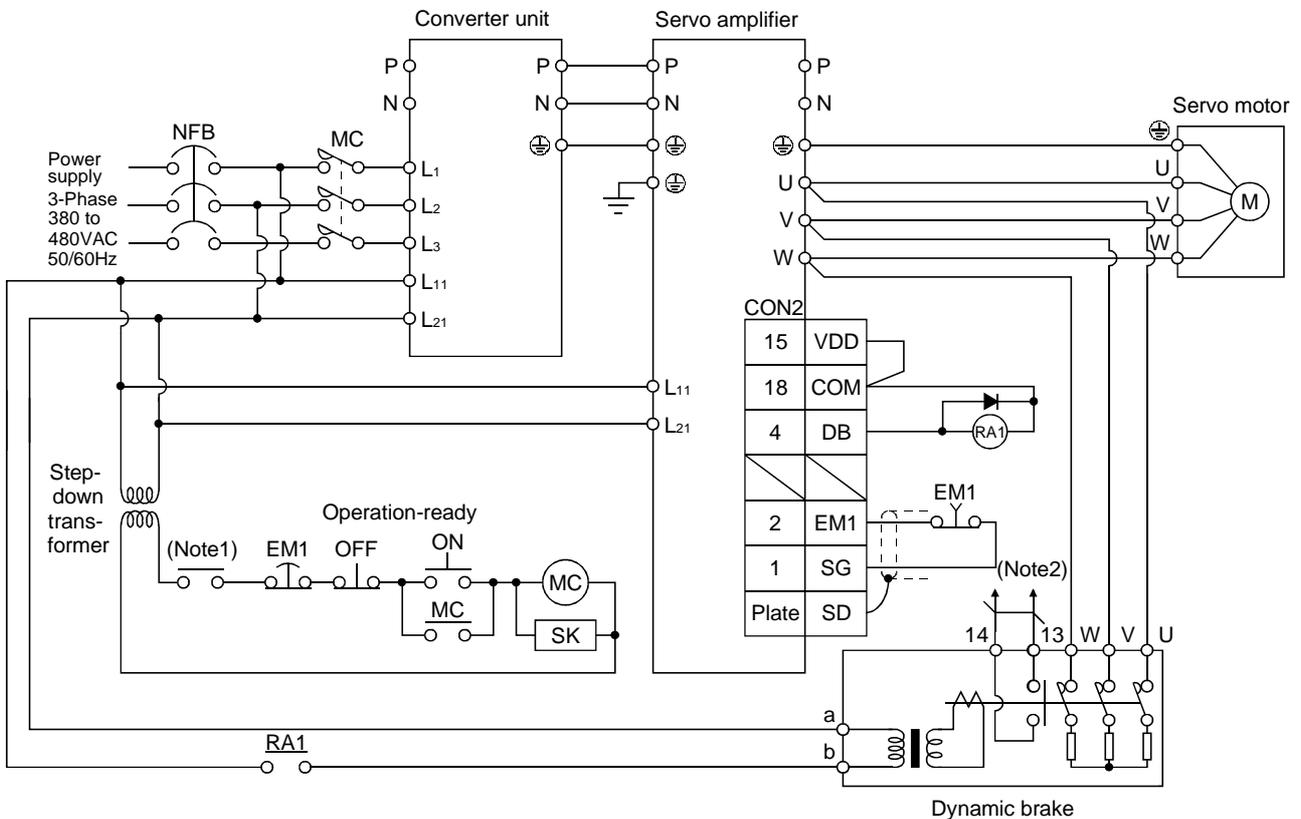
10. OPTIONS AND AUXILIARY EQUIPMENT

(a) MR-J2S-□A4



Note. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

(b) MR-J2S-□B4

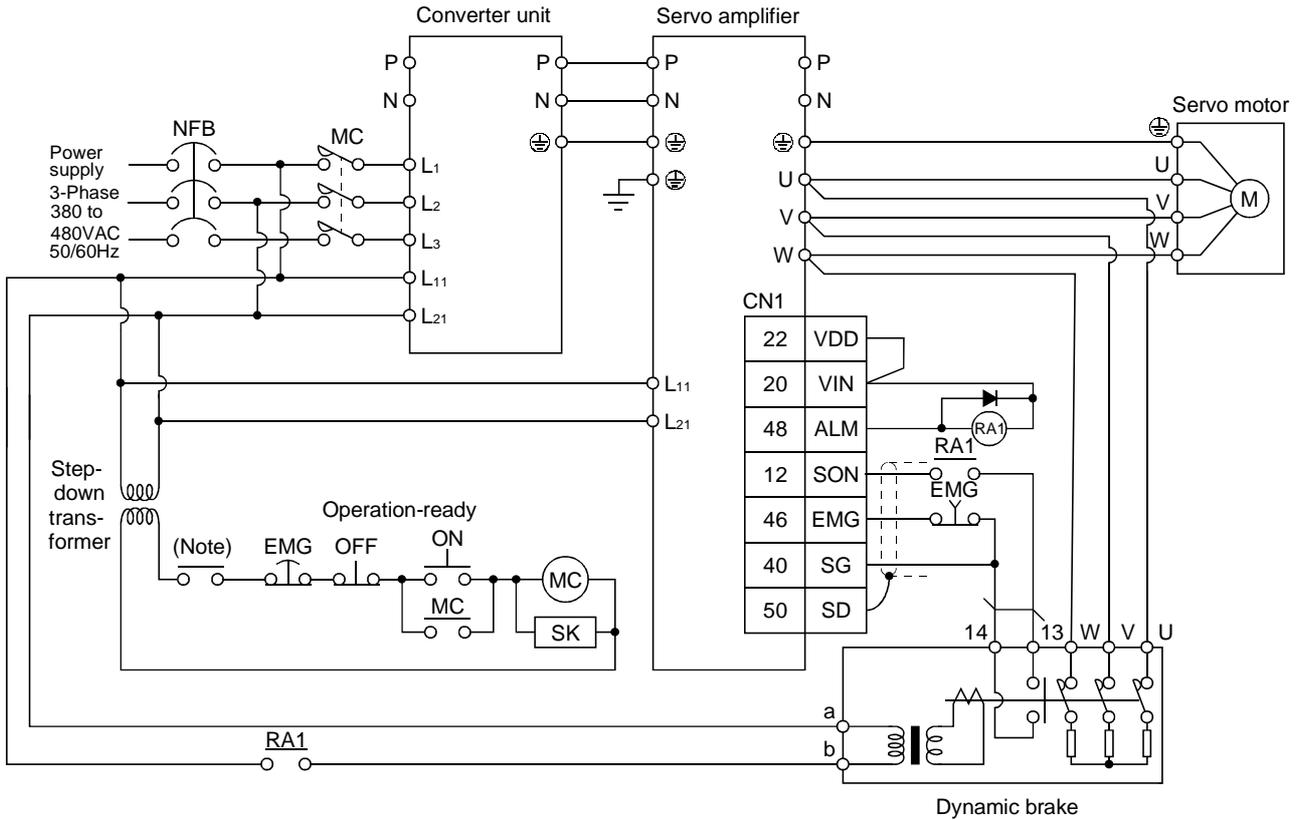


Note 1. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

2. Terminals 13, 14 are N/O contact outputs. When the dynamic brake has stuck, terminals 13, 14 are opened. Therefore, configure up the circuit to prevent servo-on in the external sequence.

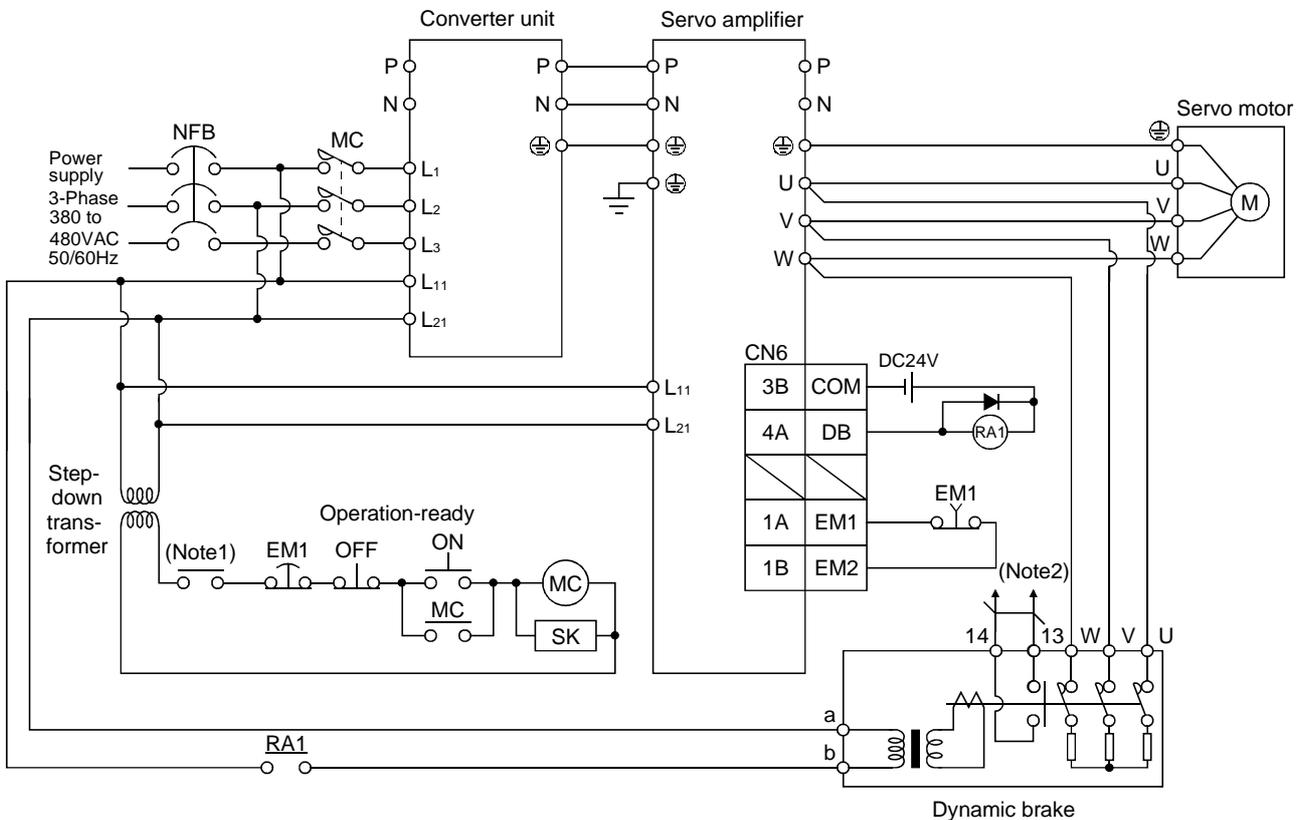
10. OPTIONS AND AUXILIARY EQUIPMENT

(c) MR-H□AN4



Note. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

(d) MR-H□BN4

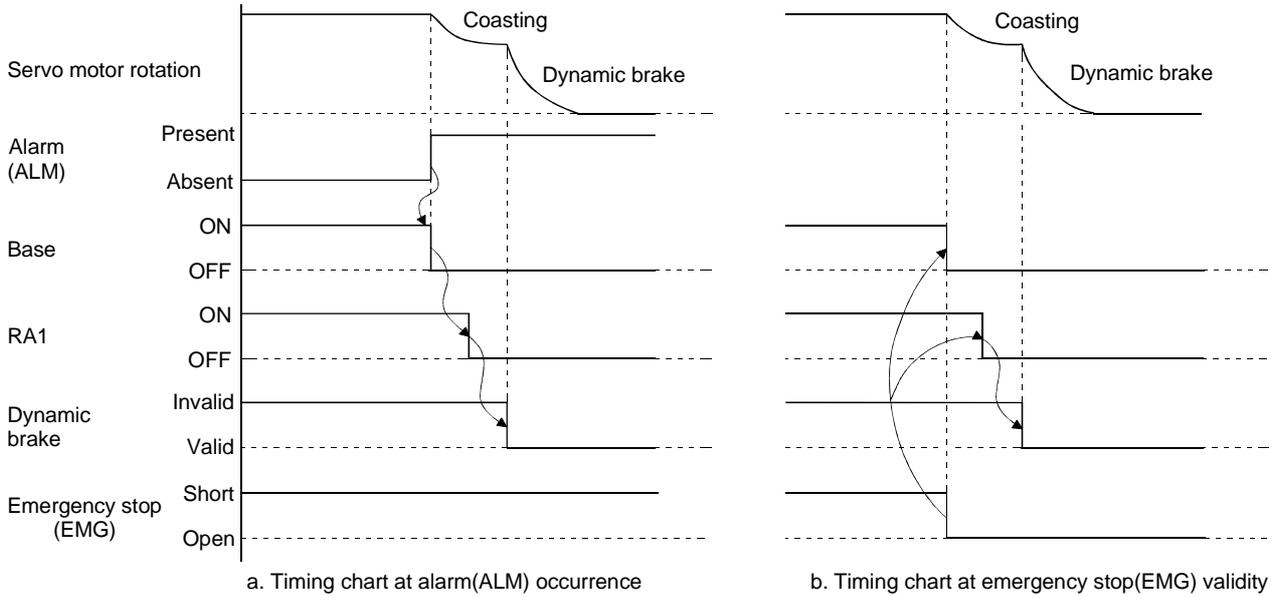


Note 1. Configure up the circuit so that power is switched off in the external sequence at servo alarm occurrence.

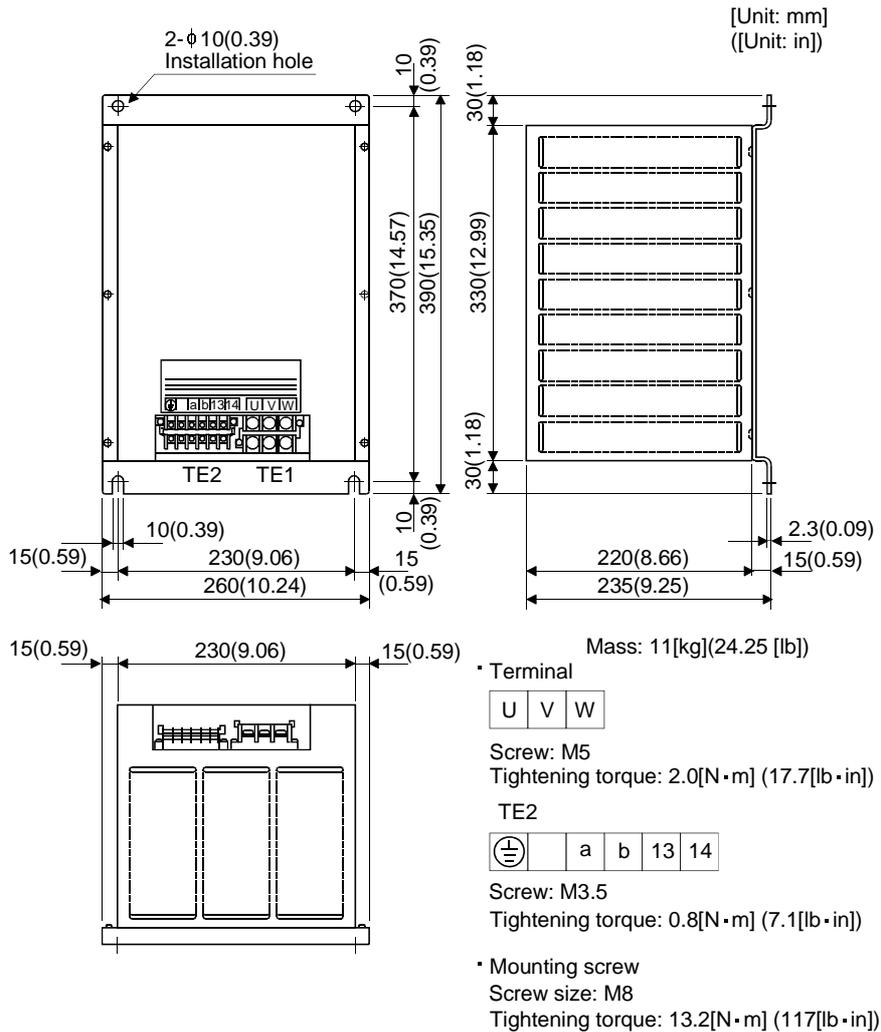
2. Terminals 13, 14 are N/O contact outputs. When the dynamic brake has stuck, terminals 13, 14 are opened. Therefore, configure up the circuit to prevent servo-on in the external sequence.

10. OPTIONS AND AUXILIARY EQUIPMENT

(3) Operation timing



(4) Outline dimension drawing



10. OPTIONS AND AUXILIARY EQUIPMENT

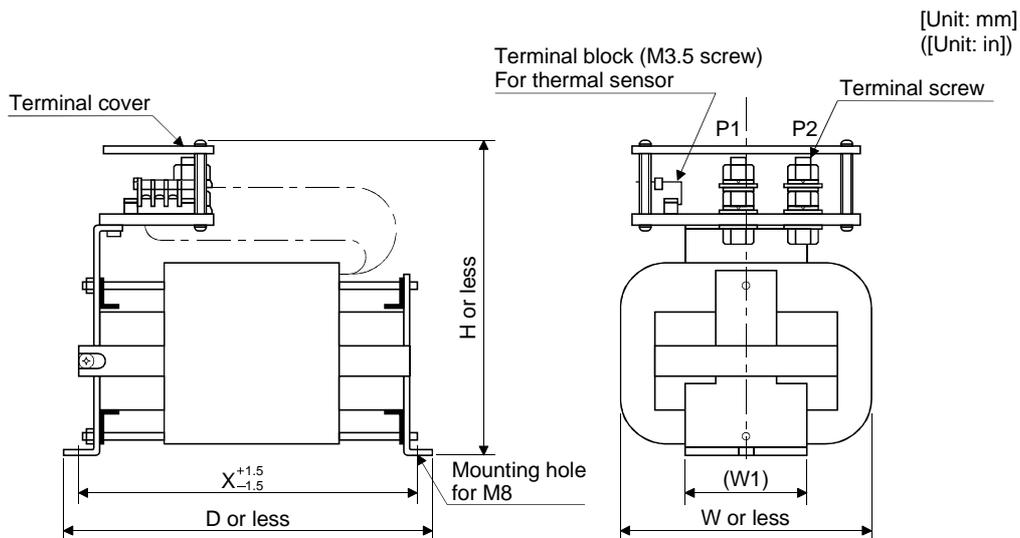
10.2.3 No-fuse breakers, magnetic contactors (400V class)

Always use one no-fuse brakers and one magnetic contactor with one servo amplifier.

Servo Amplifier	Converter unit	No-Fuse Breaker		Magnetic Contactor
		Power factor improving DC reactor is not used	Power factor improving DC reactor is used	
MR-JS-30KA4/B4 MR-H30KAN4/BN4	MR-HP55KA4	225A frame 150A	225A frame 125A	S-K95
MR-JS-37KA4/B4 MR-H37KAN4/BN4		225A frame 175A	225A frame 150A	S-K125
MR-JS-45KA4/B4 MR-H45KAN4/BN4		225A frame 225A	225A frame 175A	S-K150
MR-JS-55KA4/B4 MR-H55KAN4/BN4		400A frame 250A	225A frame 225A	S-K180

10.2.4 Power factor improving DC reactor (400V class)

Servo Amplifier	Converter unit	Power factor improving DC reactor
MR-JS-30KA4/B4 MR-H30KAN4/BN4	MR-HP55KA4	MR-DCL30K-4
MR-JS-37KA4/B4 MR-H37KAN4/BN4		MR-DCL37K-4
MR-JS-45KA4/B4 MR-H45KAN4/BN4		MR-DCL45K-4
MR-JS-55KA4/B4 MR-H55KAN4/BN4		MR-DCL55K-4

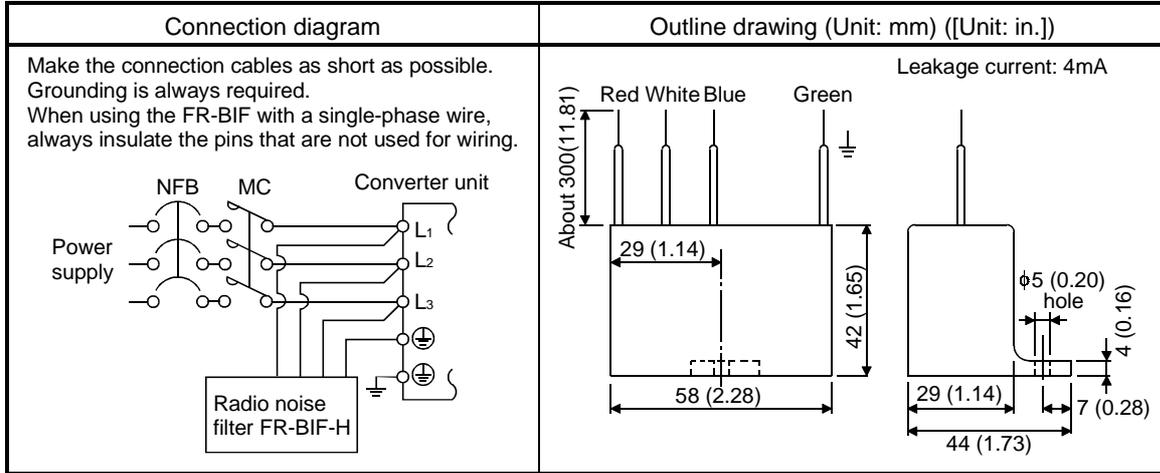


Model	W	D	H	W1	X	Terminal Screw	Mass [kg (lb)]
MR-DCL30K-4	135(5.32)	205(8.07)	200(7.87)	75(2.95)	175(6.89)	M8	Approx. 6.5(14.32)
MR-DCL37K-4	135(5.32)	225(8.86)	200(7.87)	80(3.15)	197(7.76)	M8	Approx. 7(15.42)
MR-DCL45K-4	135(5.32)	240(9.45)	200(7.87)	80(3.15)	212(8.35)	M8	Approx. 7.5(16.52)
MR-DCL55K-4	135(5.32)	260(10.24)	215(8.47)	80(3.15)	232(9.13)	M8	Approx. 9.5(20.93)

10. OPTIONS AND AUXILIARY EQUIPMENT

10.2.5 Radio noise filter (400V class)

Radio noise filter (FR-BIF-H) is effective in suppressing noises radiated from the power supply side of the servo amplifier especially in 10MHz and lower radio frequency bands. The radio noise filter is designed for the input only.



10. OPTIONS AND AUXILIARY EQUIPMENT

10.3 200V/400V class shared parts

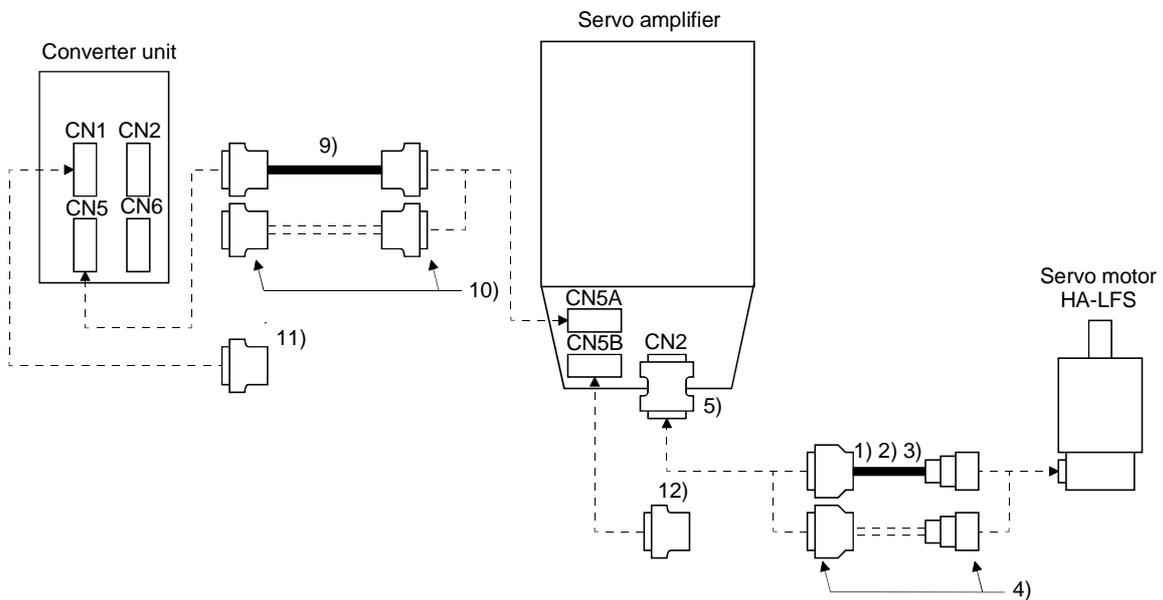
10.3.1 Cables and connectors

POINT
<ul style="list-style-type: none"> ▪ For the other connectors, refer to the Option chapter of the 22kW or less Servo Amplifier Instruction Manual. ▪ For the internal connection diagram of the cables, refer to the Option chapter of the 22kW or less Servo Amplifier Instruction Manual.

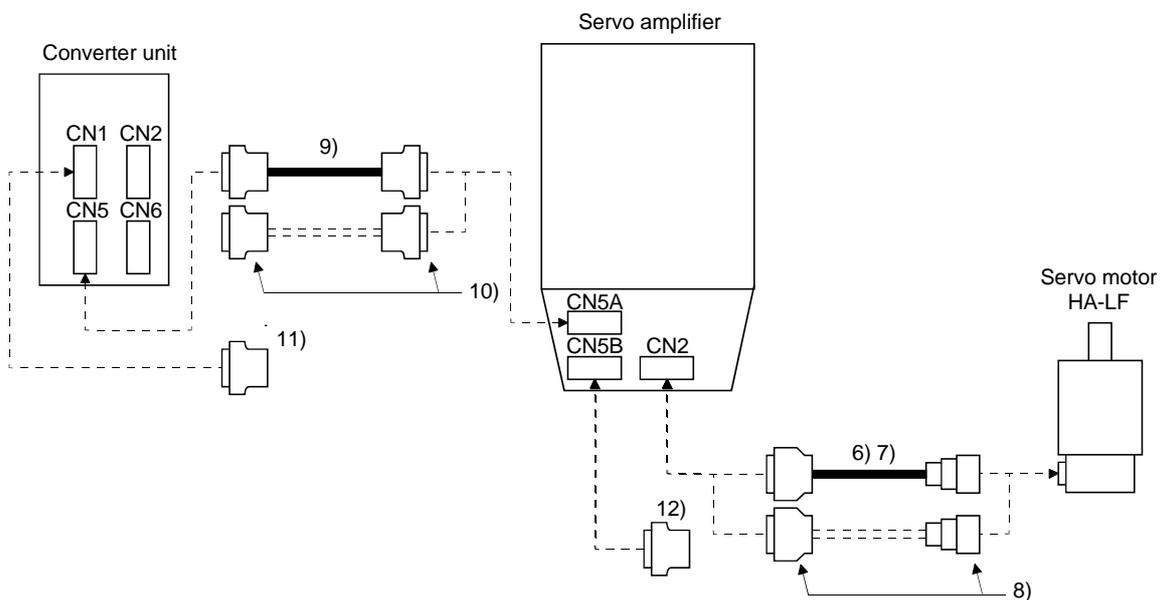
(1) Makeup of cables and like

The following shows the cable makeup for connection with the servo motor and other model.

▪ MELSERVO-J2-Super series



▪ MELSERVO-H series



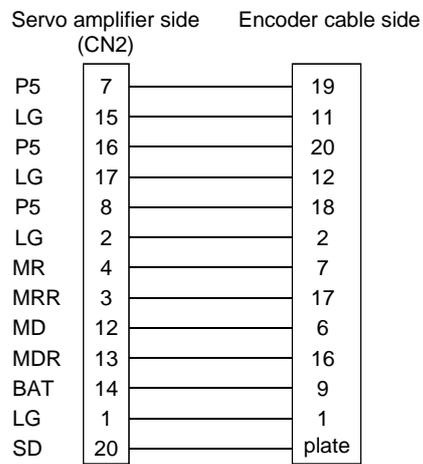
10. OPTIONS AND AUXILIARY EQUIPMENT

No.	Product Name	Model	Description		Application
1)	Standard encoder cable	MR-JHSCBL□M-L	Connector: 10120-3000VE Shell kit: 10320-52F0-008 (3M or equivalent)	Connector: MS3106B20-29S Cable clamp: MS3057-12A (DDK)	Standard flexing life IP20
2)	Long flexing life encoder cable	MR-JHSCBL□M-H			Long flexing life
3)	IP65-compliant encoder cable	MR-ENCBL□M-H	Connector: 10120-3000VE Shell kit: 10320-52F0-008 (3M or equivalent)	Connector : MS3106A20-29S (D190) Cable clamp : CE3057-12A-3 (D265) Back shell: CE02-20BS-S (DDK)	Long flexing life IP65 IP67 Not oil-resistant.
4)	Encoder connector set	MR-J2CNS	Connector: 10120-3000VE Shell kit: 10320-52F0-008 (3M or equivalent)	Connector: MS3106B20-29S Cable clamp: MS3057-12A (DDK)	IP20
5)	Conversion connector	MR-HCN2		Provided for the MELSERVO-J2-Super servo amplifier.	/
6)	Encoder cable	MR-HSCBL□M	Servo amplifier side connector (Honda Tsushin Kogyo make) Connector: PCR-S20FS Cable: PCR-LS20LA1	Encoder side connector (DDK) Plug: MS3106B20-29S Cable clamp: MS-3057-12A	Long flexing life IP22
7)	Encoder cable	MR-EN1CBL□M-H	Servo amplifier side connector (Honda Tsushin Kogyo) Connector: PCR-S20FS Cable: PCR-LS20LA1	Encoder side connector (DDK) Plug: MS3106A20-29S(D190) Cable clamp: CE-3057-12A-3(D265) Back shell: CE02-20BS-S	Long flexing life IP65 compliant
8)	Encoder connector set	MR-JSCNS	Servo amplifier side connector (Honda Tsushin Kogyo make) Connector: PCR-S20FS Cable: PCR-LS20LA1	Encoder side connector (DDK) Plug: MS3106B20-29S Cable clamp: MS3057-12A	IP22
9)	Bus cable	MR-J2HBUS□M	3M make or equivalent Connector: 10120-3000VE Shell kit: 10320-52F0-008	3M make or equivalent Connector: 10120-3000VE Shell kit: 10320-52F0-008	/
10)	Control signal connector set	MR-J2CN1	Servo amplifier side connectors (3M make or equivalent) Connector: 10120-3000VE Shell kit: 10320-52F0-008		/
11)	Connector set	MR-HP4CN1	Converter unit side connector (3M make or equivalent) Connector: 10114-3000VE Shell kit: 10314-52F0-008		/
12)	Termination connector	MR-A-TM			/

10. OPTIONS AND AUXILIARY EQUIPMENT

(2) Conversion connector (MR-HCN2)

Connection of the MELSERVO-J2-Super servo amplifier and the encoder of the HA-LFS servo motor requires the MR-HCN2 conversion connector supplied with the servo amplifier, in addition to the encoder cable. The following shows the internal connection diagram of the MR-HCN2.



10. OPTIONS AND AUXILIARY EQUIPMENT

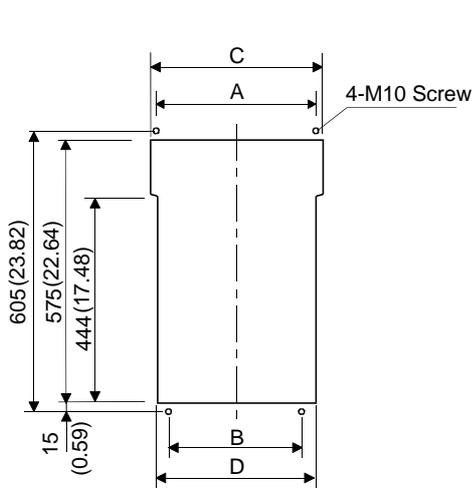
10.3.2 Heat sink outside mounting attachment (MR-ACN)

Use the heat sink outside mounting attachment to mount the heat generation area of the servo amplifier in the outside of the control box to dissipate servo amplifier-generated heat to the outside of the box and reduce the amount of heat generated in the box, thereby allowing a compact control box to be designed.

In the control box, machine a hole having the panel cut dimensions, fit the heat sink outside mounting attachment to the servo amplifier with the fitting screws (4 screws supplied), and install the servo amplifier to the control box.

The environment outside the control box when using the heat sink outside mounting attachment should be within the range of the servo amplifier operating environment conditions.

(1) Panel cut dimensions

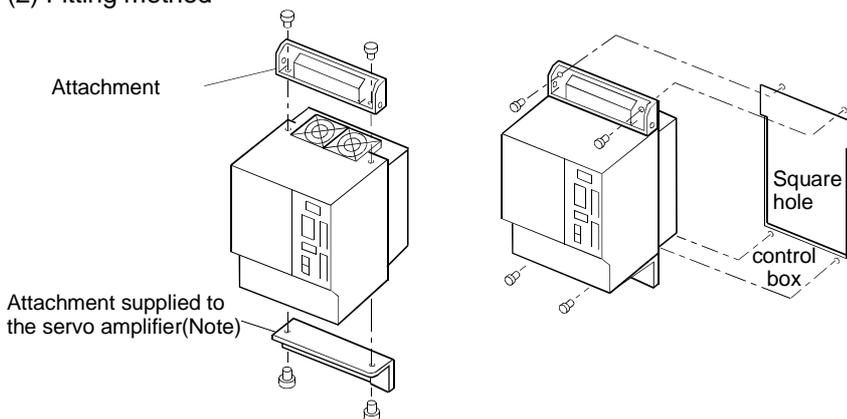


[Unit : mm(in)]

Converter unit/ Servo amplifier	Attachment	Variable Dimensions			
		A	B	C	D
MR-HP30KA	MR-ACNP55K	156 (6.16)	110 (4.33)	205 (8.09)	190 (7.48)
MR-JS-30KA/B MR-H30KAN/BN MR-JS-37KA/B MR-H37KAN/BN	MR-ACN55K	406 (15.98)	360 (14.17)	455 (17.91)	440 (17.32)

Converter unit/ Servo amplifier	Attachment	Variable Dimensions			
		A	B	C	D
MR-HP55KA4	MR-ACNP55K	156 (6.16)	110 (4.33)	205 (8.09)	190 (7.48)
MR-JS-30KA4/B4 MR-H30KAN4/BN4	MR-ACN30K	336 (13.23)	290 (11.42)	385 (15.16)	370 (14.57)
MR-JS-37KA4/B4 MR-H37KAN4/BN4 MR-JS-45KA4/B4 MR-H45KAN4/BN4 MR-JS-55KA4/B4 MR-H55KAN4/BN4	MR-ACN55K	406 (15.98)	360 (14.17)	455 (17.91)	440 (17.32)

(2) Fitting method



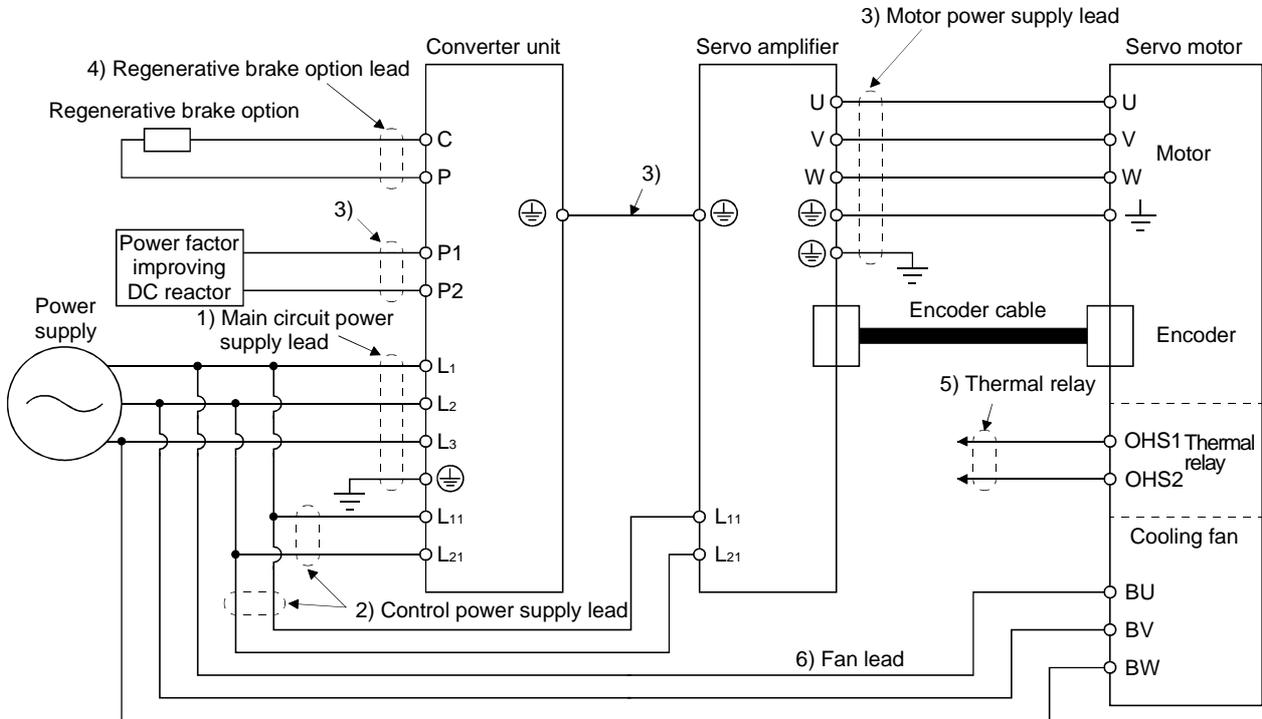
- a. Assembling the heat sink outside mounting attachment b. Installation to the control box

Note. Remove the attachment supplied and fit it in the specified position.

10. OPTIONS AND AUXILIARY EQUIPMENT

10.3.3 Recommended wires

The following diagram shows the wires used for wiring. Use the wires given in this paragraph or equivalent.



The following table lists wire sizes. The wires used assume that they are 600V vinyl wires and the wiring distance is 30m max. If the wiring distance is over 30m, choose the wire size in consideration of voltage drop.

Table 10.1 Recommended wire

Servo Amplifier	Converter unit	Wires[mm ²]					
		1) L1 · L2 L3 · ⊕	2) L11 · L21	3) U · V · W P1 · P2 · ⊕	4) P · C	5) OHS1 · OHS2	6) BU · BV · BW
MR-J2S-30KA/B MR-H30KAN/BN	MR-HP30KA	50(AWG1/0)		60(AWG2/0)			
MR-J2S-37KA/B MR-H37KAN/BN		60(AWG2/0)		80(AWG3/0)			
MR-J2S-30KA4/B4 MR-H30KAN4/BN4	MR-HP55KA4	22(AWG4)	2(AWG14)	30(AWG2)	5.5(AWG10)	1.25(AWG16)	1.25(AWG16)
MR-J2S-37KA4/B4 MR-H37KAN4/BN4		30(AWG2)		38(AWG2)			
MR-J2S-45KA4/B4 MR-H45KAN4/BN4		38(AWG2)		50(AWG1/0)			
MR-J2S-55KA4/B4 MR-H55KAN4/BN4		50(AWG1/0)		60(AWG2/0)			

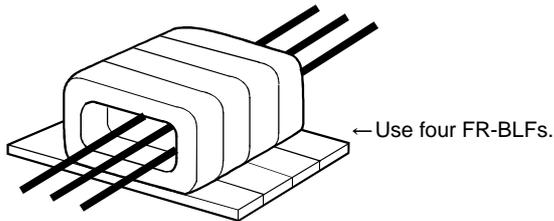
10. OPTIONS AND AUXILIARY EQUIPMENT

10.3.4 Line noise filter (FR-BLF)

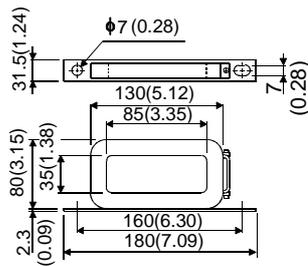
This filter is effective in suppressing noises radiated from the power supply side and output side of the servo amplifier and also in suppressing high-frequency leakage current (zero-phase current) especially within 0.5MHz to 5MHz band. The filters are used with the converter power supply wires (L1 · L2 · L3) and servo amplifier power wires (U · V · W).

(1) Usage

Pass the three-phase wires through four line noise filters. When using the line noise filters with the power wires, passing the power wires together with the ground wire will reduce the filter effect. Run the ground wire separately from the power wires.



(2) Outline drawing



10. OPTIONS AND AUXILIARY EQUIPMENT

10.3.5 Leakage current breaker

(1) Selection method

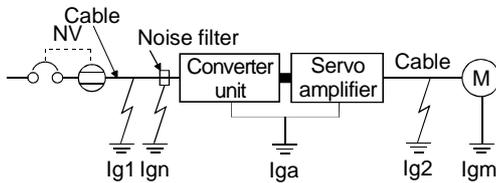
High-frequency chopper currents controlled by pulse width modulation flow in the AC servo circuits. Leakage currents containing harmonic contents are larger than those of the motor which is run with a commercial power supply.

Select a leakage current breaker according to the following formula, and ground the servo amplifier, servo motor, etc. securely.

Make the input and output cables as short as possible, and also make the grounding cable as long as possible (about 30cm (11.8 in)) to minimize leakage currents.

$$\text{Rated sensitivity current} \geq 10 \cdot \{I_{g1} + I_{gn} + I_{ga} + K \cdot (I_{g2} + I_{gm})\} \text{ [mA]} \dots\dots\dots (10.1)$$

K: Constant considering the harmonic contents



Leakage current breaker		K
Type	Mitsubishi products	
Models provided with harmonic and surge reduction techniques	NV-SP NV-SW NV-CP NV-CW NV-HW	1
General models	BV-C1 NFB NV-L	3

- Ig1: Leakage current on the electric channel from the leakage current breaker to the input terminals of the servo amplifier (Found from Fig. 10.1.)
- Ig2: Leakage current on the electric channel from the output terminals of the servo amplifier to the servo motor (Found from Fig. 10.1.)
- Ign: Leakage current when a filter is connected to the input side (4.4mA per one FR-BIF or FR-BIF-H)
- Iga: Leakage current of the servo amplifier (Found from Table 10.3.)
- Igm: Leakage current of the servo motor (Found from Table 10.2.)

Table 10.2 Servo Motor's Leakage Current Example (Igm)

Servo Motor Output [kW]	Leakage Current[mA]
30 to 55	2.5

Table 10.3 Converter Unit * Servo Amplifier's Leakage Current Example (Iga)

Converter Unit Servo Amplifier	Leakage Current[mA]
All series	5

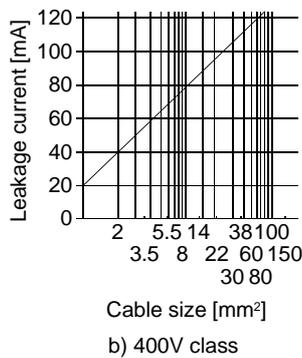
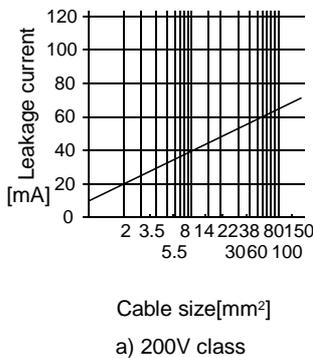
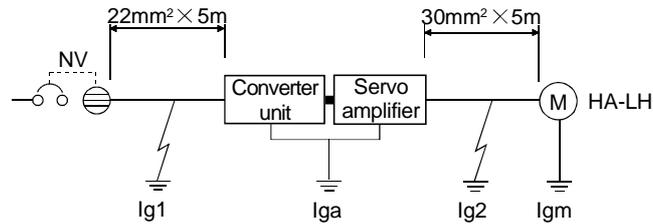


Fig.10.1 Leakage Current Example (Ig1, Ig2) for CV Cable Run in Metal Conduit

10. OPTIONS AND AUXILIARY EQUIPMENT

(2) Selection example

Indicated below is an example of selecting a leakage current breaker under the following conditions:



Use a leakage current breaker designed for suppressing harmonics/surges.

Find the terms of Equation (10.1) from the diagram:

$$I_{g1} = 95 \times \frac{5}{1000} = 0.475 \text{ [mA]}$$

$$I_{g2} = 105 \times \frac{5}{1000} = 0.525 \text{ [mA]}$$

$I_{gn}=0$ (not used)

$I_{ga}=5$ [mA]

$I_{gm}=2.5$ [mA]

Insert these values in Equation (9.1):

$$I_g \geq 10 \cdot \{0.475 + 0 + 5 + 1 \cdot (0.525 + 2.5)\} \\ \geq 85 \text{ [mA]}$$

According to the result of calculation, use a leakage current breaker having the rated sensitivity current (I_g) of 145.5[mA] or more. A leakage current breaker having I_g of 85[mA] is used with the NV-SP/SW/CP/CW/HW series.

APPENDIX

App 1. Combination of servo amplifier and servo motor

The servo amplifier software versions compatible with the servo motors are indicated in the parentheses. The servo amplifiers whose software versions are not indicated can be used regardless of the versions.

• MELSERVO-J2-Super series

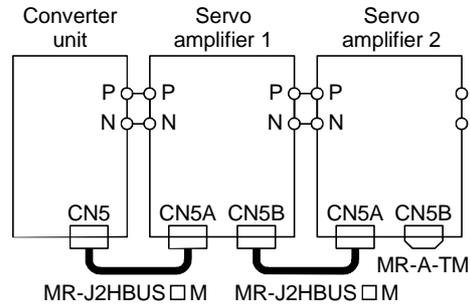
Servo motor	Servo amplifier (Software version)	
	MR-J2S-□A□	MR-J2S-□B□
HA-LFS30K1	MR-J2S-30KA	MR-J2S-30KB (Version A3 or later)
HA-LFS30K1M	MR-J2S-30KA	MR-J2S-30KB (Version A3 or later)
HA-LFS30K2	MR-J2S-30KA	MR-J2S-30KB (Version A3 or later)
HA-LFS37K2	MR-J2S-37KA	MR-J2S-37KB (Version A3 or later)
HA-LFS30K14	MR-J2S-30KA4	MR-J2S-30KB4
HA-LFS30K1M4	MR-J2S-30KA4 (Version A2 or later)	MR-J2S-30KB4 (Version A4 or later)
HA-LFS37K1M4	MR-J2S-37KA4	MR-J2S-37KB4 (Version A3 or later)
HA-LFS45K1M4	MR-J2S-45KA4	MR-J2S-45KB4 (Version A3 or later)
HA-LFS50K1M4	MR-J2S-55KA4	MR-J2S-55KB4 (Version A3 or later)
HA-LFS30K24	MR-J2S-30KA4	MR-J2S-30KB4 (Version A3 or later)
HA-LFS37K24	MR-J2S-37KA4	MR-J2S-37KB4 (Version A3 or later)
HA-LFS45K24	MR-J2S-45KA4	MR-J2S-45KB4 (Version A3 or later)
HA-LFS55K24	MR-J2S-55KA4	MR-J2S-55KB4 (Version A3 or later)

• MELSERVO-H series

Servo motor	Servo amplifier (Software version)	
	MR-H□A□	MR-H□B□
HA-LF30K2	MR-H30KAN	MR-H30KBN
HA-LF37K2	MR-H37KAN	MR-H37KBN
HA-LF30K24	MR-H30KAN4	MR-H30KBN4
HA-LF37K24	MR-H37KAN4	MR-H37KBN4
HA-LF45K24	MR-HK45AN4	MR-HK45BN4
HA-LF55K24	MR-HK55AN4	MR-HK55BN4

App 2. Parallel Connection of Two Servo Amplifiers (400V class)

For the 400V class, two servo amplifiers can be connected to one converter unit. Reset the alarm that occurred in the converter unit from the servo amplifier 1.



When using the servo amplifiers in this way, strictly observe the following points.

- 1) The sum of the (servo motor output capacity \times effective load factor) results is not more than the 55kW.
- 2) (Servo motor output capacity \times peak load factor) is not more than 137kW.
- 3) Within the overload protection characteristic of the converter unit. (Refer to Section 9.1.)
- 4) The series and types of the two servo amplifiers connected are the same.

REVISIONS

*The manual number is given on the bottom left of the back cover.

Print Data	*Manual Number	Revision
Oct, 2002	SH(NA)030024-A	First edition
Mar., 2003	SH(NA)030024-B	<p><About sale>: Deleted</p> <p>Section 1.2 and Section 1.3: Exchanged</p> <p>Section 1.2: Partial figure change, Note 2 addition</p> <p>Section 1.4.1, Section 1.4.2 (2): Change of permissible voltage fluctuations of main circuit power supply and control circuit power supply Old: Three-phase 323 to 506VAC, 50/60Hz</p> <p>Section 3.2.1 (1): Old: "CN1A same as in MR-J2S-700A". New: "CN1B same as in MR-J2S-700A".</p> <p>(2): "MBR" and "DB" of CON2 exchanged.</p> <p>Section 3.3.1 (2): Figure change</p> <p>Section 3.4: Change of motor thermal relay contents in table</p> <p>Section 5.2.1 (1): Sentence deletion</p> <p>(2): Sentence deletion</p> <p>(3): Sentence deletion</p> <p>(4): Sentence deletion</p> <p>Section 5.2.2 (1): Sentence deletion</p> <p>(2): Sentence deletion</p> <p>(3): Sentence deletion</p> <p>Section 10.2. 2 (2): Partial figure change</p>
Nov., 2004	SH(NA)030024-C	<p>Safety Instructions</p> <p>2. To prevent fire, note the following: Sentence change</p> <p>3. To prevent injury, note the following: Sentence addition/change</p> <p>CONFORMANCE WITH UL/ C-UL STANDARD (4): Sentence change</p> <p>Section 1.6: Sentence change, table change</p> <p>Section 3.3.1 (1): POINT addition, figure addition</p> <p>(2): POINT addition, figure addition</p> <p>Section 7.1.3 A. E9: Contents change</p> <p>Section 9.1: Figure/Remarks change</p> <p>Chapter 10: POINT change</p> <p>Section 10.1.1: POINT addition</p> <p>(4): Sentence change, figure change</p> <p>(5): Mounting screw specifications addition</p> <p>Section 10.1.2 (2): Figure addition</p> <p>(3): Mounting screw specifications addition</p> <p>Section 10.2.1: POINT addition</p> <p>(4): Sentence change, figure change</p> <p>(5): Mounting screw specifications addition</p> <p>Section 10.2.2 (2): Figure addition</p> <p>(3): Mounting screw specifications addition</p> <p>Appendix 1: Addition</p>

MODEL	
MODEL CODE	



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