

# **INVERTER**

## **FR-AF800**

### **INSTALLATION GUIDELINE**

**FR-AF820-01540 to 04750**

**FR-AF840-00770 to 06830**

**FR-AF842-07700 to 12120**

**FR-AF860-00680 to 04420**

**FR-AF862-05450 to 08500**

Thank you for choosing this Mitsubishi Electric inverter base unit.

This Installation Guideline provides handling information and precautions for use of this product. Incorrect handling might cause an unexpected fault. Before using this product, always read this Installation Guideline carefully to use this product correctly.

In addition, carefully read the Instruction Manual (Startup) enclosed with the separate control circuit board. Do not use this product until you have a full knowledge of the product, safety information, and instructions. Please forward this Installation Guideline to the end user.

#### **CONTENTS**

<b>1. Introduction .....</b>	<b>2</b>
<b>2. Outline .....</b>	<b>2</b>
<b>3. Product Check .....</b>	<b>3</b>
<b>4. Setting Up.....</b>	<b>11</b>
<b>5. Operation check for the safety stop function .</b>	<b>18</b>

# 1 Introduction

Thank you for choosing this Mitsubishi Electric Inverter base unit.

This Installation Guideline explains how to set up an inverter base unit and a separately sold control circuit board.

Read this Installation Guideline carefully to use this product correctly.

Please forward this Installation Guideline to the end user.

## 2 Outline

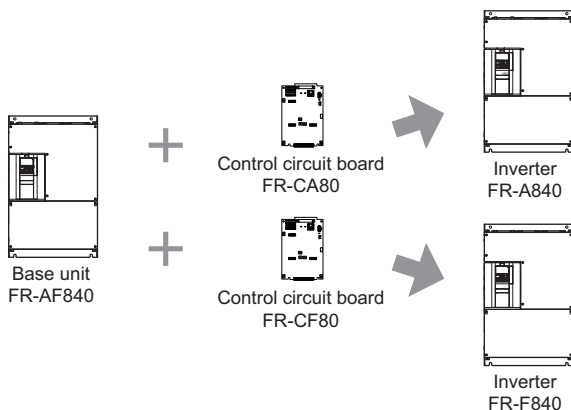
The FR-AF800 is a base unit of the inverter.

A base unit is a main circuit section of the inverter, where three-phase AC power is converted to DC power and then converted to any three-phase AC power.

A control circuit board is a control circuit section which controls the inverter.

A base unit alone cannot be operated.

By combining the base unit and a separately sold control circuit board, they function as an inverter.



### POINT

- The product made up of a base unit and a control circuit board complies with UL and EC directives (CE mark).
- If a combination of the base unit and control circuit board is not correct, an inverter fault (E.PE2) occurs, disabling the inverter operation.

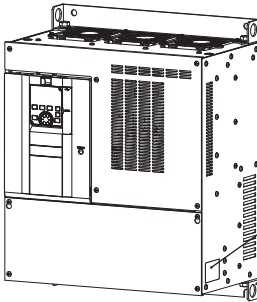
# 3 Product Check

## ●Base unit

Symbol	Voltage class	Symbol	Structure, functionality	Symbol	Description
2	200 V class	0	Standard model	00770 to 12120	Inverter SLD rated current (A)
4	400 V class	2	Separated converter type		
6	600 V class				

F R - AF 8 20 - 00770 - 60

Symbol	Circuit board coating	Plated conductor	CN8 connector
60	With	Without	Without
U6	With	With	With



Rating plate	
Inverter model	MODEL FR-AF840-00770-60
Input rating	INPUT : XXXXX
Output rating	OUTPUT : XXXXX
SERIAL	SERIAL : XXXXXXXXX
Country of origin	MADE IN XXXXX

	Overload Current Rating	Ambient Temperature
SLD	110% 60s, 120% 3s	40°C (104°F)
LD	120% 60s, 150% 3s	50°C (122°F)
ND	150% 60s, 200% 3s	50°C (122°F)
HD	200% 60s, 250% 3s	50°C (122°F)

## ● Accessory

- Installation guideline (this guideline)
- For the FR-AF820-U6, BCN-C22005-721 and BCN-C22005-742 (Instruction Manual Supplement) are enclosed.

●Control circuit board accessory

Symbol	Description
CA80	Control unit for FR-A800
CF80	Control unit for FR-F800

Symbol	Compatible base unit		
	Voltage class	FR-CA80	FR-CF80
01	200	01540 to 03160	01540 to 04750
	400	00770 to 01800	00770 to 12120
	600	00680, 01080	00680 to 08500
02	200	03800, 04750	-
	400	02160 to 12120	-
	600	01440 to 08500	-

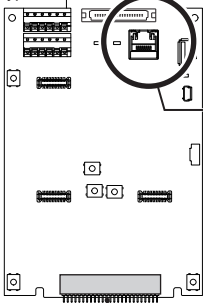
FR - CA80 - 01 - E1 - 60

Symbol	Communication type
None	RS-485 communication
E	Ethernet
G	Ethernet safety communication

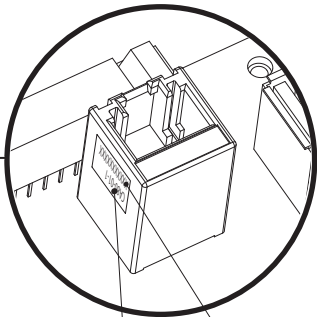
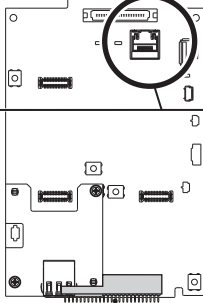
Symbol	Type
1	FM
2	CA
3	CA3

Symbol	Circuit board coating
60	With

RS-485 communication type

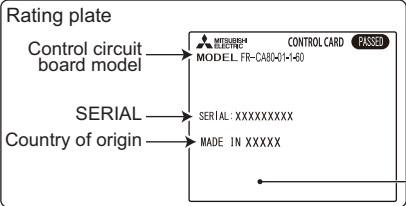


Ethernet type

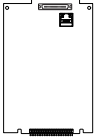







Control circuit board model SERIAL board model

**Sponge for connector pin protection**  
Remove a sponge for connector pin protection before installing the control unit to the base unit.  
Use care not to bend pins of the connector.



**Rating plate of the control circuit board**  
The rating plate is placed on the plastic bag.

control circuit board 1 	Control circuit terminal block 1 	Sticker .....1 FR-CA80-[-]-[-]-60 <b>A800</b> FR-CF80-[-]-[-]-60 <b>F800</b> FR-CA80-[-]-E[-]-60 CC-Link IE <small>Field Basic</small> <b>A800-E</b> FR-CF80-[-]-E[-]-60 CC-Link IE <small>Field Basic</small> <b>F800-E</b>
Cable ..... 1 	Mounting screw (M3 × 6 mm) .....2 (3*1) 	Earth plate.....1*2 
Earth cable ..... 1*2 	Instruction Manual .....1*3	CD ..... 1*3*4

- \*1 For the FR-CA80-[-]-E[-]-[-], the FR-CA80-[-]-G[-]-[-] and the FR-CF80-[-]-E[-]-[-], three mounting screws are supplied.
- \*2 For the FR-CA80-[-]-E[-]-[-], the FR-CA80-[-]-G[-]-[-] and the FR-CF80-[-]-E[-]-[-], this accessory is supplied.
- \*3 For the Instruction Manual and CD related to the inverter model in combination with the base unit and the control circuit board, refer to [page 7](#).
- \*4 The CD is not included with the control circuit boards that have the following SERIAL numbers. For how to read the SERIAL number, refer to [page 6](#).

Product	Country of origin indication	SERIAL
Control circuit board	Made in Japan	□4Z□□□□□□ or later
	Made in China	□51□□□□□□ or later

# ●Changeover between inverter and high power factor converter

The inverter/converter switching function is available for inverters which satisfy all the following conditions.

- The high power factor converter option (FR-A8AVP) is installed on the inverter.\*1
  - \*1 The plug-in option FR-A8AVP cannot be used with the FR-A800-G.
- The inverter consists of the FR-AF842 (base unit) and the FR-CA80-02 (control circuit board).
- The base unit has one of the following SERIALs printed on the rating plate and packaging.
- The control circuit board has one of the following SERIALs printed on the rating plate, PU connector, and packaging.

Product	Country of origin indication	SERIAL
Base unit	Made in Japan	□91○○○○○ or later
Control circuit board		□86○○○○○ or later
Base unit	Made in China	□92○○○○○ or later
Control circuit board		□87○○○○○ or later

## ●SERIAL number

□    7    Z    ○○○○○○    \*1  
Symbol   Year   Month   Control number

- \*1 The SERIAL consists of one symbol, two characters indicating the production year and month, and six characters indicating the control number. The last digit of the production year is indicated as the Year, and the Month is indicated by 1 to 9, X (October), Y (November), or Z (December).

## ◆ Combination of the inverter and the Instruction Manual

The Instruction Manual and CD related to the inverter model in combination with the base unit and the control circuit board are shown below.

Inverter model as a result of combination	SLD rated current	Base unit model	Control circuit board model	Reference manual <sup>※3</sup>		CD-ROM <sup>※3</sup>
				Manual name	Manual number	
FR-A820-□-1-60	01540 to 03160	FR-AF820-□-60	FR-CA80-01-1-60	A800 INSTRUCTION MANUAL (STARTUP)	IB-J6000493 or IB-J6000955ENG	BKO-CA2250 or BKO-CA2898
FR-A820-□-1-U6	03800, 04750	FR-AF820-□-U6	FR-CA80-02-1-60			
FR-A840-□-1-60	00770 to 01800	FR-AF840-□-60	FR-CA80-01-1-60			
FR-A840-□-1-U6	02160 to 06830	FR-AF840-□-U6	FR-CA80-02-1-60			
FR-A840-□-2-60	00770 to 01800	FR-AF840-□-60	FR-CA80-01-2-60	FR-A802 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-J6000534ENG	BKO-CA2378
FR-A842-□-1-U6	02160 to 06830	FR-AF842-□-U6	FR-CA80-02-2-60			
FR-A842-□-2-60	07700 to 12120	FR-AF842-□-60	FR-CA80-01-1-60			
FR-A860-□-1-60	00680, 01080 01440 to 04420	FR-AF860-□-60	FR-CA80-02-1-60			
FR-A862-□-1-60	05450 to 08500	FR-AF862-□-60	FR-CA80-02-1-60	FR-A862 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-J6000571ENG	BKO-CA2486
FR-A820-□-E1-60	01540 to 03160	FR-AF820-□-60	FR-CA80-01-E1-60			
FR-A820-□-E1-U6	03800, 04750	FR-AF820-□-U6	FR-CA80-02-E1-60			
FR-A840-□-E1-60	00770 to 01800	FR-AF840-□-60	FR-CA80-01-E1-60			
FR-A840-□-E1-U6	02160 to 06830	FR-AF840-□-U6	FR-CA80-02-E1-60	FR-A800-E INSTRUCTION MANUAL (STARTUP)	IB-J6000626	BKO-CA2492
FR-A840-□-E2-60	00770 to 01800	FR-AF840-□-60	FR-CA80-01-E2-60			
FR-A842-□-E1-U6	02160 to 06830	FR-AF842-□-U6	FR-CA80-02-E2-60			
FR-A842-□-E2-60	07700 to 12120	FR-AF842-□-60	FR-CA80-02-E1-60			
FR-A860-□-E1-60	00680, 01080 01440 to 04420	FR-AF860-□-60	FR-CA80-01-E1-60	FR-A860-E (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-J6000638ENG	BKO-CA2492
FR-A862-□-E1-60	05450 to 08500	FR-AF862-□-60	FR-CA80-02-E1-60			

Inverter model as a result of combination	SLD rated current	Base unit model	Control circuit board model	Reference manual <sup>3)</sup>		CD-ROM <sup>3)</sup>
				Manual name	Manual number	
FR-F820-[-]-3-60- <sup>1)</sup>	01540 to 03160	FR-AF820-[-]-60	FR-CF80-01-3-60	F800 INSTRUCTION MANUAL (STARTUP)	IB-0600545 or IB-0600955ENG	BKO-CA2336 or BKO-CA2898
FR-F820-[-]-3-U6- <sup>1)</sup>	03800, 04750	FR-AF820-[-]-U6	FR-CF80-01-2-60			
FR-F840-[-]-2-60	00770 to 06830	FR-AF840-[-]-60	FR-CF80-01-3-60			
FR-F840-[-]-3-60- <sup>1)</sup>	00770 to 01800	FR-AF840-[-]-U6	FR-CF80-01-2-60	FR-F802 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600550ENG	
FR-F842-[-]-3-U6- <sup>1)</sup>	02160 to 06830		FR-CF80-01-3-60			
FR-F842-[-]-2-60	07700 to 12120	FR-AF842-[-]-U6	FR-F860 (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	FR-F862 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600689ENG	BKO-CA2548
FR-F842-[-]-3-U6- <sup>1)</sup>	00680, 01080 01440 to 04420	FR-AF860-[-]-60	FR-CF80-01-3-60			
FR-F860-[-]-3-60- <sup>1)</sup>	05450 to 08500	FR-AF862-[-]-60	FR-CF80-01-3-60	F800-E INSTRUCTION MANUAL (STARTUP)	IB-0600643	BKO-CA2553
FR-F820-[-]-E3-60- <sup>2)</sup>	01540 to 03160	FR-AF820-[-]-60	FR-CF80-01-E3-60			
FR-F820-[-]-E3-U6- <sup>2)</sup>	03800, 04750	FR-AF820-[-]-U6	FR-CF80-01-E2-60			
FR-F840-[-]-E2-60	00770 to 06830	FR-AF840-[-]-60	FR-CF80-01-E3-60	FR-F802-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600648ENG	
FR-F840-[-]-E3-60- <sup>2)</sup>	00770 to 01800	FR-AF840-[-]-U6	FR-CF80-01-E2-60			
FR-F840-[-]-E3-U6- <sup>2)</sup>	02160 to 06830	FR-AF842-[-]-60	FR-CF80-01-E3-60			
FR-F842-[-]-E2-60	07700 to 12120	FR-AF842-[-]-U6	FR-F860-E (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	FR-F862-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600691ENG	BKO-CA2554
FR-F842-[-]-E3-U6- <sup>2)</sup>	00680, 01080 01440 to 04420	FR-AF860-[-]-60	FR-CF80-01-E3-60			
FR-F860-[-]-E3-60	05450 to 08500	FR-AF862-[-]-60				



Inverter model as a result of combination	SLD rated current	Base unit model	Control circuit board model	Reference manual*3		CD-ROM *3
				Manual name	Manual number	
FR-A820-I-G1-U6	01540 to 03160	FR-AF820-I-U6	FR-CA80-01-G1-60	FR-A800-F/G INSTRUCTION MANUAL (STARTUP)	IB-0600941	BKO-CA2940
FR-A820-I-G1-U6	03800, 04750	FR-AF820-I-U6	FR-CA80-02-G1-60			
FR-A840-I-G1-U6	00770 to 01800	FR-AF840-I-U6	FR-CA80-01-G1-60			
FR-A840-I-G1-U6	02160 to 06830	FR-AF840-I-U6	FR-CA80-02-G1-60			
FR-A840-I-G2-60	00770 to 01800	FR-AF840-I-U6	FR-CA80-01-G2-60			
	02160 to 06830		FR-CA80-02-G2-60			
FR-A842-I-G1-U6	07700 to 12120	FR-AF842-I-U6	FR-CA80-02-G1-60	FR-A802-F/G (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600978ENG	
FR-A842-I-G2-60	07700 to 12120	FR-AF842-I-U6	FR-CA80-02-G2-60			

- \*1 The Instruction Manual Supplement (BCN-C22005-708) regarding the FR-F800 CA3 type is also enclosed.  
 \*2 The Instruction Manual Supplement (BCN-C22005-773) regarding the FR-F800-E CA3 type is also enclosed.  
 \*3 CDs are not required to use the Instruction Manuals listed on the next page.

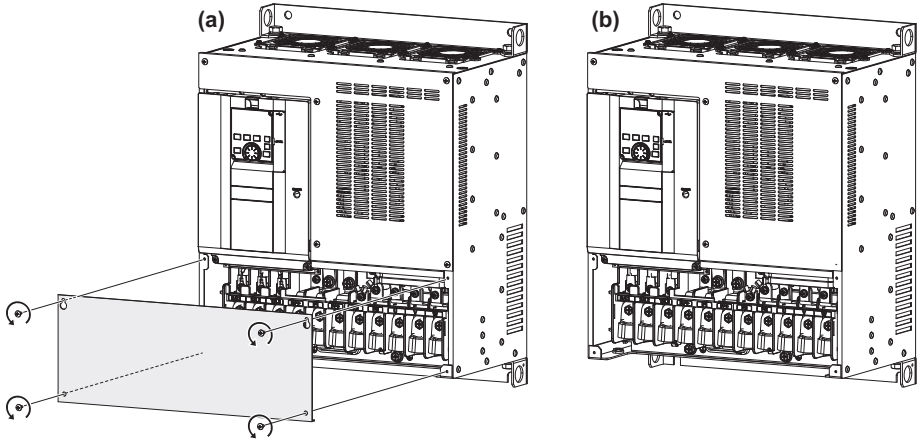
### POINT

- If a combination of the base unit and control circuit board is not correct, an inverter fault (E.PE2) occurs, disabling the inverter operation.

Manual name	Manual number
A800 INSTRUCTION MANUAL (STARTUP)	IB-0600493-L or later or IB-0600955ENG-A or later
FR-A802 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600534ENG-D or later
FR-A860 (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-0600562ENG-G or later
FR-A862 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600571ENG-D or later
A800-E INSTRUCTION MANUAL (STARTUP)	IB-0600626-G or later
FR-A802-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600631ENG-C or later
FR-A860-E (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-0600638ENG-E or later
FR-A862-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600639ENG-C or later
F800 INSTRUCTION MANUAL (STARTUP)	IB-0600545-F or later or IB-0600955ENG-A or later
FR-F802 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600550ENG-D or later
FR-F860 (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-0600690ENG-D or later
FR-F862 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600689ENG-D or later
F800-E INSTRUCTION MANUAL (STARTUP)	IB-0600643-E or later
FR-F802-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600648ENG-C or later
FR-F860-E (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-0600691ENG-D or later
FR-F862-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600692ENG-D or later
FR-A800-F/G INSTRUCTION MANUAL (STARTUP)	IB-0600941-C or later
FR-A802-F/G (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600978ENG-B or later

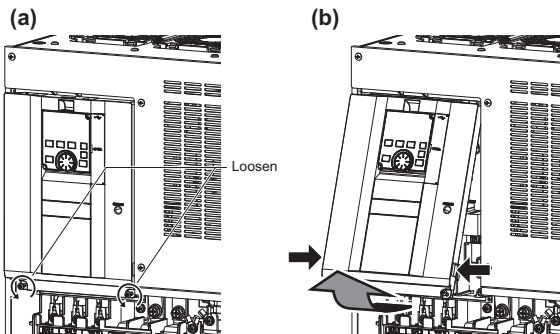
## 4 Setting Up

### ◆ Removal of a base unit front cover (lower side)



- (a) When the mounting screws are removed, the front cover (lower side) can be removed.
- (b) With the front cover (lower side) removed, wiring of the main circuit terminals can be performed.

### ◆ Removal of a base unit front cover (upper side)

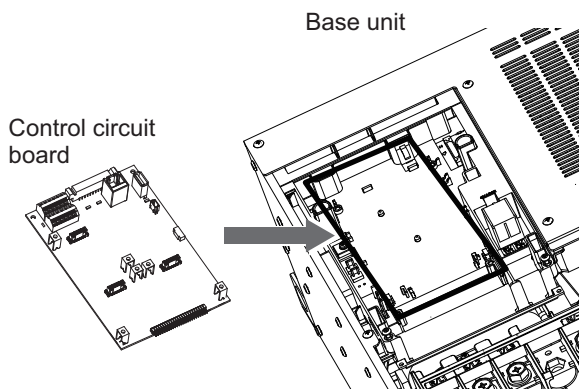


- (a) With the front cover (lower side) removed, loosen the mounting screws on the front cover (upper side). (These screws cannot be removed.)
- (b) Holding the areas around the installation hooks on the sides of the front cover (upper side), pull out the cover using its upper side as a support.

## ◆ Installing a control circuit board on a base unit

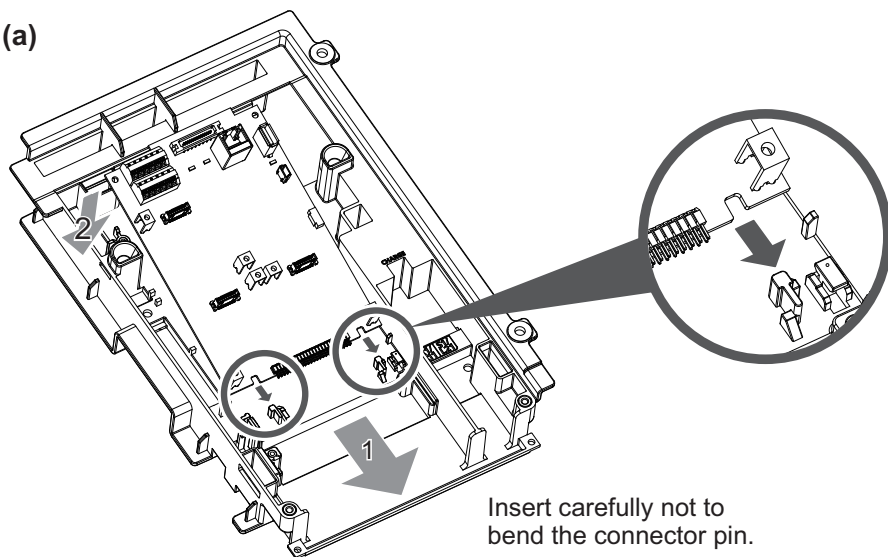
Install the control circuit board to the base unit.

Remove a sponge for protecting the connector pin of the control circuit terminals.

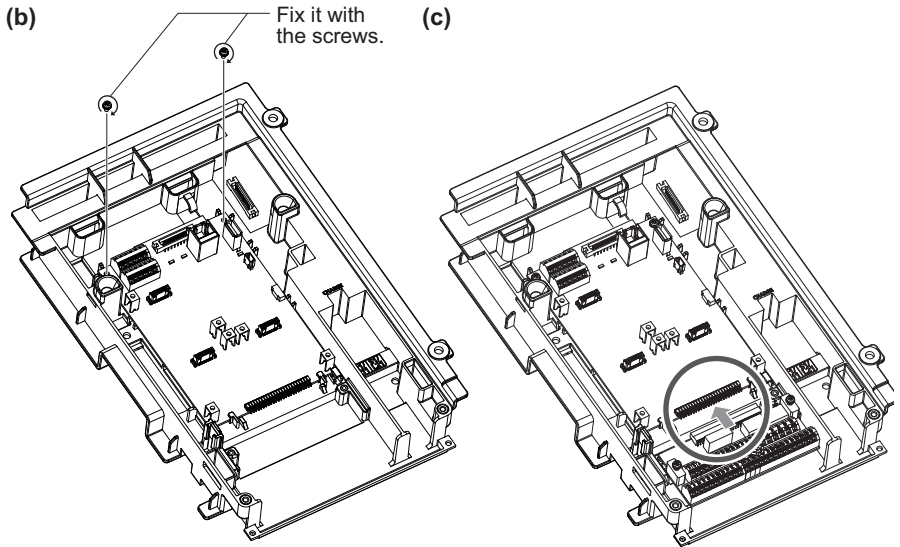


Install the control circuit board according to the following steps.

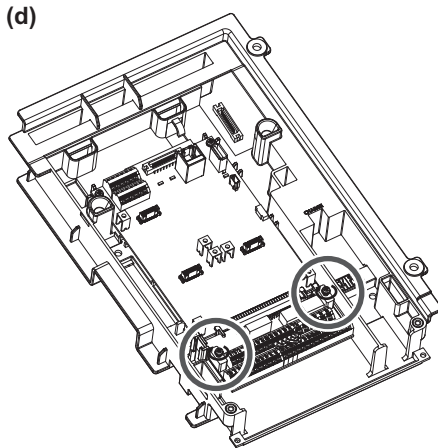
(a)



(a) Tilt the control circuit board, fit it into the hooks of the base unit, then lay it flat.



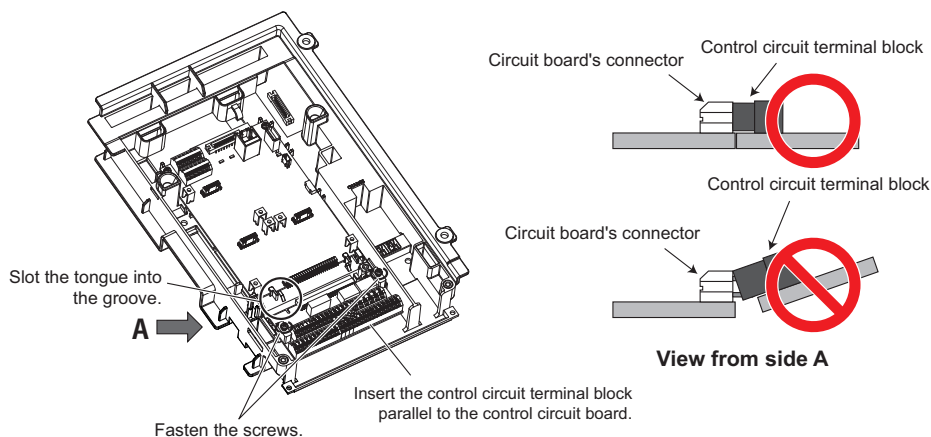
- (b) Fix it to the base unit with the supplied mounting screws.
- (c) Be careful not to bend the pins of the inverter control circuit connector when installing the control circuit terminal block.



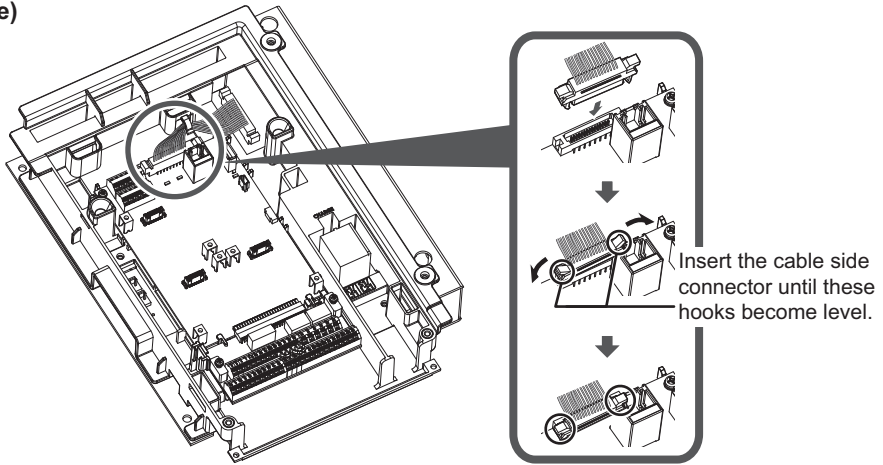
- (d) Tighten the screws on the control terminal block unit to fix it to the base unit.

## NOTE

- The following are precautions for installation of the control circuit terminal block.
- Observe the following precautions and handle the inverter properly to avoid malfunctions or failures.
- To install the control circuit terminal block, keep it upright so that it is parallel with the control circuit board.
- Slide the terminal block upward so that the tongues on the circuit board slot into the grooves on the terminal block.
- Check that the control circuit terminal block is parallel to the control circuit board, and that the pins on the control circuit connector are not bent. After checking proper connection, fix the control circuit terminal block in place with two screws.



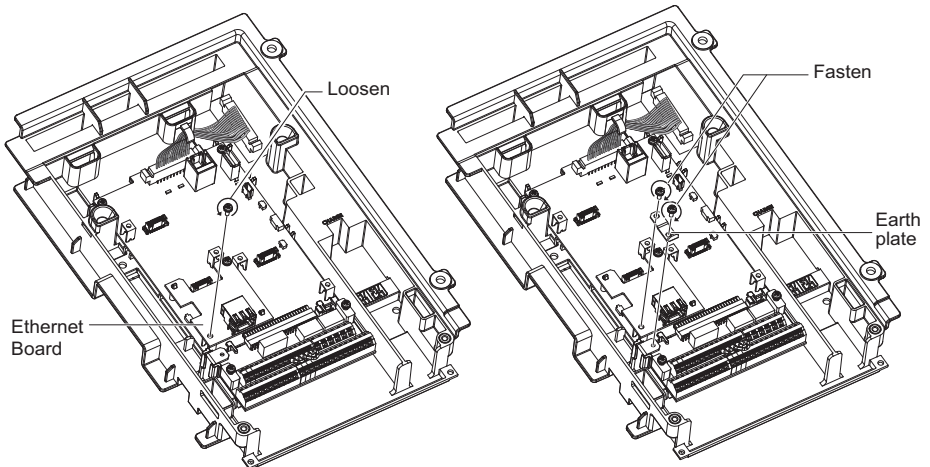
(e)



- (e) Connect the cable to the connector of the control circuit board and the connector on the upper right of the base unit. Route the cable through this hook.

(f)

For the FR-CA80/CF80-[-E-] and the FR-CA80-[-G-] control circuit board, install the earth plate.

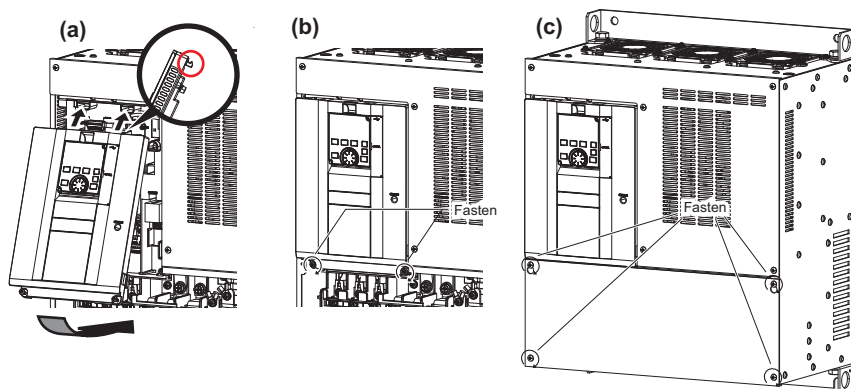


- (f) Remove the mounting screw on the bottom left of the Ethernet board before installing the Ethernet board earth plate to the base unit.

## NOTE

- When a communication option is used, installation of the supplied earthing (grounding) cable is required. For the details on how to install it, refer to the supplied Instruction Manual (for the FR-CA80/CF80-[-]E[-] and the FR-CA80-[-]G[-] control circuit board only).
- Make sure that the screws are tightened securely.

## ◆ Reinstallation of base unit front covers



- Insert the upper hooks of the front cover (upper side) into the sockets of the inverter. Securely install the front cover (upper side) to the inverter by fixing the hooks on the sides of the cover into place.
- Tighten the mounting screw(s) at the lower part of the front cover (upper side).
- Fasten the front cover (lower side) with the mounting screws.

## NOTE

- Fully make sure that the front covers are installed securely. Always tighten the mounting screws of the front covers.

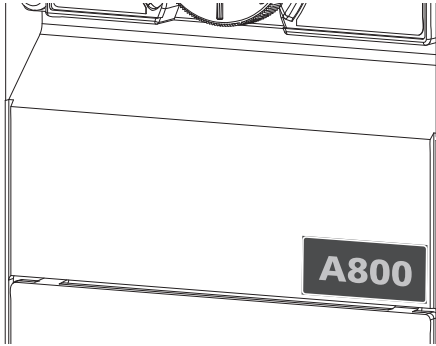


## ◆Applying a logo sticker

Apply a sticker provided with the control circuit board on the base unit as shown below.

FR-CA80-[-]-60, FR-CF80-[-]-60

FR-CA80-[-]E[-]60, FR-CF80-[-]E[-]60



## ◆Completed

When set-up is completed, it can be used as the FR-A800 or FR-F800.

Refer to the Instruction Manual provided with the control circuit board for details of operation, specifications, etc.

# 5    Operation check for the safety stop function

This chapter is not applicable to FR-A800-G inverters.

After completing the work for "4. Setting up", be sure to perform the self-diagnostic test of the safety stop function and operation check.

If the operation check is not performed, the safety stop function may not operate properly.

For details on the safety stop function, refer to the Safety Stop Function Instruction Manual (BCN-A23228-001).

## ◆ Safety stop function with SIL 3 certification

The inverter should meet the following conditions to comply with Safety Integrity Level (SIL) 3 of the international standard IEC 61508:2010 for functional safety.

- Both the base unit and the control circuit board are compliant with SIL 3.
- The base unit has one of the following SERIALs printed on the rating plate and packaging.
- The control circuit board has one of the following SERIALs printed on the rating plate, PU connector, and packaging.

Product	Country of origin indication	SERIAL*1
Base unit Control circuit board	Made in Japan	□86○○○○○ or later
Base unit Control circuit board	Made in China	□87○○○○○ or later

\*1    For how to read the SERIAL number, refer to [page 6](#).

## ◆ Self diagnostic test

The FR-A800/F800 inverter has the self-diagnostic test function at power-ON.

If the FR-A800/F800 inverter outputs a fault signal (SA, E.SAF) at power-ON, take the action described below.

## ◆ Diagnostic

If a failure is detected, the FR-A800/F800 inverter outputs a fault signal and 'E.SAF' is indicated at the display. When the FR-A800/F800 inverter outputs a fault signal, take following actions.

If the inverter outputs the fault signal, observe the following procedure.

- 1) Check that the input signal logic is the same between S1-SIC and S2-SIC. If these are different, correct the input signal and reset the FR-A800/F800 inverter.
- 2) Disconnect the wires from terminals S1, S2, and SIC, then reset or turn OFF and ON the power. If the 'SA' is indicated on the operation panel, there is a failure in the system except for the FR-A800/F800 inverter. When 'E.SAF' is indicated and a fault signal is output, a fault may be occurring in the FR-A800/F800 inverter

## ◆ Operation check procedure

Check the operation of the safety stop function as follows.

- 1) Change and check the I/O state between S1-SIC and S2-SIC shown in the following matrix of the safety related signals.
- 2) If the inverter operation differs from the one shown in the matrix, the FR-A800/F800 may have a fault.
- 3) If the inverter operates as described in the matrix, check the system performance. Press the emergency switch, press the start/restart button while a failure is detected (So(SO)-SOC opened), and so on.
- 4) Finally clear the fault history of the FR-A800/F800 inverter (see the Instruction Manual for how to clear the fault history).

The FR-A800/F800 inverter's safety related I/O status obeys the following matrix.

## Matrix of safety related signals

Input power	Internal safety circuit status	Input terminal*1, *2		Output terminal	Operation panel indication	
		S1	S2		E.SAF*6	SA*7
OFF	—	—	—	OFF	Not displayed	Not displayed
ON	Normal	ON	ON	ON *3	Not displayed	Not displayed
	Normal	ON	OFF	OFF *4	Displayed	Displayed
	Normal	OFF	ON	OFF *4	Displayed	Displayed
	Normal	OFF	OFF	ON *3	Not displayed	Displayed
	Fault	ON	ON	OFF	Displayed	Not displayed *5
	Fault	ON	OFF	OFF	Displayed	Displayed
	Fault	OFF	ON	OFF	Displayed	Displayed
	Fault	OFF	OFF	OFF	Displayed	Displayed

\*1 ON: The transistor is conducted. OFF: The transistor is not conducted.

\*2 When not using the safety stop function, short across terminals S1 and PC, S2 and PC, and SIC and SD to use the inverter. (In the initial status, terminals S1 and PC, S2 and PC, and SIC and SD are respectively shorted with shorting wires.)

\*3 If any of the faults shown in the following table occurs, terminal So (SO) and the SAFE signal turn OFF. When a fault occurs in parallel operated inverters, only the inverters in which the protective function is activated stop the output of the SAFE signal.

Fault	Operation panel indication	Fault	Operation panel indication
Option fault	E.OPT	Overspeed occurrence	E.OS
Communication option fault	E.OP1 to E.OP3	Speed deviation excess detection	E.OSD
Parameter storage device fault	E.PE	Signal loss detection	E.ECT
Retry count excess	E.RET	Excessive position fault	E.OD
Parameter storage device fault	E.PE2	Encoder signal loss for orientation	E.ECA
Internal storage device fault	E.PE6	Brake sequence fault	E.MB1 to E.MB7
Operation panel power supply short circuit/ RS-485 terminals power supply short circuit	E.CTE	Encoder phase fault	E.EP
		Magnetic pole position unknown	E.MP
24 VDC power fault	E.P24	CPU fault	E.CPU
Safety circuit fault	E.SAF		E.5 to E.7
		Internal circuit fault	E.13

\*4 When the internal safety circuit is operated normally, the terminal So (SO) and the SAFE signal remain ON until E.SAF is displayed, and the terminal So (SO) and the SAFE signal turn OFF when E.SAF is displayed.

\*5 SA is displayed when the terminals S1 and S2 are identified as OFF due to the internal safety circuit failure.

\*6 If another fault occurs at the same time as E.SAF, the other fault can be displayed.

\*7 If another warning occurs at the same time as SA, the other warning can be displayed.

### NOTE

- The response time from safety stop signal input to drive shutoff (safe state) is faster than 8 ms.
- Hold the ON or OFF status for 2 ms or longer to input signal to terminal S1 or S2. Signal input shorter than 2 ms is not recognized.

## WARRANTY

When using this product, make sure to understand the warranty described below.

### 1. Warranty period and coverage

We will repair any failure or defect (hereinafter referred to as "failure") in our FA equipment (hereinafter referred to as the "Product") arisen during warranty period at no charge due to causes for which we are responsible through the distributor from which you purchased the Product or our service provider. However, we will charge the actual cost of dispatching our engineer for an on-site repair work on request by customer in Japan or overseas countries. We are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit are repaired or replaced.

#### [Term]

The term of warranty for Product is twelve months after your purchase or delivery of the Product to a place designated by you or eighteen months from the date of manufacture whichever comes first ("Warranty Period"). Warranty period for repaired Product cannot exceed beyond the original warranty period before any repair work.

#### [Limitations]

- (1) You are requested to conduct an initial failure diagnosis by yourself, as a general rule. It can also be carried out by us or our service company upon your request and the actual cost will be charged. However, it will not be charged if we are responsible for the cause of the failure.
- (2) This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and user manual for the Product and the caution label affixed to the Product.
- (3) Even during the term of warranty, the repair cost will be charged on you in the following cases;
  - a failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem
  - a failure caused by any alteration, etc. to the Product made on your side without our approval
  - a failure which may be regarded as avoidable, if your equipment in which the Product is incorporated is equipped with a safety device required by applicable laws and has any function or structure considered to be indispensable according to a common sense in the industry
  - a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced
  - any replacement of consumable parts (condenser, cooling fan, etc.)
  - a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning and natural disasters
  - a failure caused by using the emergency drive function
  - a failure generated by an unforeseeable cause with a scientific technology that was not available at the time of the shipment of the Product from our company
  - any other failures which we are not responsible for or which you acknowledge we are not responsible for

### 2. Term of warranty after the stop of production

- (1) We may accept the repair at charge for another seven (7) years after the production of the product is discontinued. The announcement of the stop of production for each model can be seen in our Sales and Service, etc.
- (2) Please note that the Product (including its spare parts) cannot be ordered after its stop of production.

---

### 3. Service in overseas

Our regional FA Center in overseas countries will accept the repair work of the Product; however, the terms and conditions of the repair work may differ depending on each FA Center. Please ask your local FA center for details.

### 4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi Electric shall not be liable for compensation to:

- (1) Damages caused by any cause found not to be the responsibility of Mitsubishi Electric.
- (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi Electric products.
- (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi Electric products.
- (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

### 5. Change of Product specifications

Specifications listed in our catalogs, manuals or technical documents may be changed without notice.

### 6. Application and use of the Product

- (1) For the use of our product, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in product, and a backup or fail-safe function should operate on an external system to product when any failure or malfunction occurs.
- (2) Our product is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used. In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used. We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.

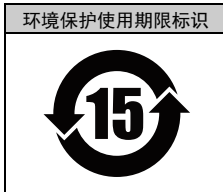
## Restricted Use of Hazardous Substances in Electronic and Electrical Products

The mark of restricted use of hazardous substances in electronic and electrical products is applied to the product as follows based on the "Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products" of the People's Republic of China.

### 关于电器电子产品有害物质限制使用

根据中华人民共和国的《电器电子产品有害物质限制使用管理办法》，对适用于产品的“电器电子产品有害物质限制使用标识”的内容记载如下。

电器电子产品有害物质限制使用标识要求



本产品中所含有的有害物质的名称、含量、含有部件如下表所示。

- 产品中所含有害物质的名称及含量

部件名称*2	有害物质*1					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电路板组件（包括印刷电路板及其构成的零部件，如电阻、电容、集成电路、连接器等）、电子部件	×	○	×	○	○	○
金属壳体、金属部件	×	○	○	○	○	○
树脂壳体、树脂部件	○	○	○	○	○	○
螺丝、电线	○	○	○	○	○	○

上表依据SJ/T11364的规定编制。

○：表示该有害物质在该部件所有均质材料中的含量均在GB/T26572规定的限量要求以下。

×：表示该有害物质在该部件的至少一种均质材料中的含量超出GB/T26572规定的限量要求。

\*1 即使表中记载为 ×，根据产品型号，也可能会有有害物质的含量为限制值以下的情况。

\*2 根据产品型号，一部分部件可能不包含在产品中。

## Referenced Standard (Requirement of Chinese standardized law)

This Product is designed and manufactured accordance with following Chinese standards.

Machinery safety\*: GB/T 16855.1

GB/T 12668.502

GB 28526

GB/T 12668.3

Electrical safety: GB/T 12668.501

EMC: GB/T 12668.3

\* Only the safety stop function model meets the listed standards.

---

## Compliance with the UK certification scheme

We declare that this product conforms with the related technical requirements under UK legislation, and affix the UKCA (UK Conformity Assessed) marking on the product. Approval conditions are the same as those for the EU Directives. (Refer to the Instruction Manual (Startup) of the relevant model.)



### UKCA marking:

The UKCA marking is used for products sold in the markets of Great Britain (England, Wales, and Scotland) from January 1, 2021 after the departure of the UK from the EU on January 31, 2020.





# MEMO

---

# MEMO



## REVISIONS

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

Revision Date	*Manual Number	Revision
Oct. 2016	IB(NA)-0600687ENG-A	First edition
Nov. 2018	IB(NA)-0600687ENG-B	Added <ul style="list-style-type: none"><li>• Inverter/converter switching</li><li>• Safety Integrity Level (SIL) 3</li><li>• Referenced Standard (Requirement of Chinese standardized law)</li></ul>
Jul. 2020	IB(NA)-0600687ENG-C	Edited <ul style="list-style-type: none"><li>• Combination of the inverter and the Instruction Manual</li></ul>
Dec. 2021	IB(NA)-0600687ENG-D	Added <ul style="list-style-type: none"><li>• FR-A800-G</li></ul>
Sep. 2023	IB(NA)-0600687ENG-E	Added <ul style="list-style-type: none"><li>• FR-CA80-01-G1-60</li><li>• FR-CA80-02-G1-60</li></ul>
Oct. 2024	IB(NA)-0600687ENG-F	Added <ul style="list-style-type: none"><li>• Internal storage device fault (E.PE6)</li></ul> Edited <ul style="list-style-type: none"><li>• Combination of the inverter and the Instruction Manual</li><li>• Operation check for the safety stop function</li></ul>

## HEADQUARTERS

Mitsubishi Electric Europe B.V. EUROPE  
Mitsubishi-Electric-Platz 1  
**D-40882 Ratingen**  
Phone: +49 (0)2102 / 486-0  
Fax: +49 (0)2102 / 486-1120

Mitsubishi Electric Europe B.V. CZECH REP.  
Pekařská 621/7  
**CZ-155 00 Praha 5**  
Phone: +420 255 719 200  
Fax: +420 251 551 471

Mitsubishi Electric Europe B.V. FRANCE  
25, Boulevard des Minimes  
**F-92741 Nanterre Cedex**  
Phone: +33 (0)1 / 55 68 55 68  
Fax: +33 (0)1 / 55 68 57 57

Mitsubishi Electric Europe B.V. IRELAND  
Westgate Business Park, Ballymount  
**IRL-Dublin 24**  
Phone: +353 (0)1 4198800  
Fax: +353 (0)1 4198890

Mitsubishi Electric Europe B.V. ITALY  
Viale Colleoni 7 Palazzo Sirio  
**I-20064 Agrate Brianza (MB)**  
Phone: +39 039 / 60 53 1  
Fax: +39 039 / 60 53 12

Mitsubishi Electric Europe B.V. NETHERLANDS  
Nijverheidsweg 23C  
**NL-3641RP Mijdrecht**  
Phone: +31 (0) 297 250 350

Mitsubishi Electric Europe B.V. POLAND  
ul. Krakowska 50  
**PL-32-083 Balice**  
Phone: +48 (0) 12 347 65 00  
Fax: +48 (0) 12 340 47 01

Mitsubishi Electric (Russia) LLC RUSSIA  
2 bld. 1, Letnikovskaya st.  
**RU-115114 Moscow**  
Phone: +7 495 / 721 2070  
Fax: +7 495 / 721 2071

Mitsubishi Electric Europe B.V. SPAIN  
Carretera de Rubí 76-80 Apdo. 420  
**E-08190 Sant Cugat del Vallés (Barcelona)**  
Phone: +34 (0) 93 / 5653131  
Fax: +34 (0) 93 / 5891579

Mitsubishi Electric Europe B.V. (Scandinavien) SWEDEN  
Hedvig Möllers gata 6,  
**SE- 223 55 Lund**  
Phone: +46 (0) 8 625 10 00

Mitsubishi Electric Turkey Elektrik Ürünleri A.Ş. TURKEY  
Fabrika Otomasyonu Merkezi  
Şerifali Mahallesi Nutuk Sokak No.5  
**TR-34775 Ümraniye-İSTANBUL**  
Phone: +90 (216) 969 25 00  
Fax: +90 (216) / 526 39 95

Mitsubishi Electric Europe B.V. UK  
Travellers Lane  
**UK-Hatfield, Herts. AL10 8XB**  
Phone: +44 (0)1707 / 28 87 80  
Fax: +44 (0)1707 / 27 86 95

Mitsubishi Electric Europe B.V. UAE  
Dubai Silicon Oasis  
**United Arab Emirates - Dubai**  
Phone: +971 4 3724716  
Fax: +971 4 3724721

Mitsubishi Electric Corporation JAPAN  
Tokyo Building 2-7-3  
Marunouchi, Chiyoda-ku  
**Tokyo 100-8310**  
Phone: +81 (3) 3218-2111  
Fax: +81 (3) 3218-2185

Mitsubishi Electric Automation, Inc. USA  
500 Corporate Woods Parkway  
**Vernon Hills, IL 60061**  
Phone: +1 (847) 478-2100  
Fax: +1 (847) 478-0328

## EUROPEAN REPRESENTATIVES

GEVA AUSTRIA  
Wiener Straße 89  
**A-2500 Baden**  
Phone: +43 (0)2252 / 85 55 20  
Fax: +43 (0)2252 / 488 60

OOO TECHNİKON BELARUS  
Prospect Nezavisimosti 177-9  
**BY-220125 Minsk**  
Phone: +375 (0)17 / 393 1177  
Fax: +375 (0)17 / 393 0081

INEA RBT d.o.o. BOSNIA AND HERZEGOVINA  
Sieghe 11  
**SI-1000 Ljubljana**  
Phone: +386 (0)1 / 513 8116  
Fax: +386 (0)1 / 513 8170

AKHNATON BULGARIA  
4, Andrei Ljapchev Blvd., PO Box 21  
**BG-1756 Sofia**  
Phone: +359 (0)2 / 817 6000  
Fax: +359 (0)2 / 97 44 06 1

INEA CR CROATIA  
Losinjska 4 a  
**HR-10000 Zagreb**  
Phone: +385 (0)1 / 36 940 - 01/-02/-03  
Fax: +385 (0)1 / 36 940 - 03

AutoCont C. S. S.R.O. CZECH REPUBLIC  
Kafkova 185/33  
**CZ-702 00 Ostrava 2**  
Phone: +420 595 691 150  
Fax: +420 595 691 199

HANS FØLSGAARD A/S DENMARK  
Theilgaardstr Torv 1  
**DK-4600 Køge**  
Phone: +45 4320 8600  
Fax: +45 4396 8855

Electrobit OU ESTONIA  
Pärnu mnt. 160i  
**EST-11317, Tallinn**  
Phone: +372 6518 140

UTU Automation Oy FINLAND  
Peltotie 37i  
**FIN-28400 Ulvila**  
Phone: +358 (0)207 / 463 500  
Fax: +358 207 / 463 501

UTECO A.B.E.E. GREECE  
5, Mavrogenous Str.  
**GR-18542 Piraeus**  
Phone: +30 (0)211 / 1206-900  
Fax: +30 (0)211 / 1206-999

MELTRADE Kft. HUNGARY  
Fertő utca 14,  
**HU-1107 Budapest**  
Phone: +36 (0)1 / 431-9726  
Fax: +36 (0)1 / 431-9727

OAK Integrator Products SIA LATVIA  
Ritausmas iela 23  
**LV-1058 Riga**  
Phone: +371 67842280

Automatikos Centras, UAB LITHUANIA  
Neries krantinė 14A-101  
**LT-48397 Kaunas**  
Phone: +370 37 262707  
Fax: +370 37 455605

ALFATRADA Ltd. MALTA  
99, Paola Hill  
**Malta-Paola PLA 1702**  
Phone: +356 (0)21 / 697 816  
Fax: +356 (0)21 / 697 817

## EUROPEAN REPRESENTATIVES

INTEHS SRL MOLDOVA  
bld. Traian 23/1  
**MD-2060 Kishinev**  
Phone: +373 (0)22 / 66 4242  
Fax: +373 (0)22 / 66 4280

Fonseca S.A. PORTUGAL  
R. João Francisco do Casal 87/89  
**PT-3801-997 Aveiro, Esqueira**  
Phone: +351 (0)234 / 303 900  
Fax: +351 (0)234 / 303 910

SIRIUS TRADING & SERVICES SRL ROMANIA  
Aleea Lacul Morii Nr. 3  
**RO-060841 Bucuresti, Sector 6**  
Phone: +40 (0)21 / 430 40 06  
Fax: +40 (0)21 / 430 40 02

INEA SR d.o.o. SERBIA  
Ul. Karadjordjeva 12/217  
**SER-11300 Smederevo**  
Phone: +386 (0)202 461 54 01

SIMPAS SK (Západné Slovensko) SLOVAKIA  
Dolné Pažite 603/97  
**SK-911 06 Trenčín**  
Phone: +421 (0)32 743 04 72  
Fax: +421 (0)32 743 75 20

INEA RBT d.o.o. SLOVENIA  
Stegne 11  
**SI-1000 Ljubljana**  
Phone: +386 (0)1 / 513 8116  
Fax: +386 (0)1 / 513 8170

OMNI RAYAG SWITZERLAND  
Im Schörl 5  
**CH-8600 Dübendorf**  
Phone: +41 (0)44 / 802 28 80  
Fax: +41 (0)44 / 802 28 28

CSC-AUTOMATION Ltd. UKRAINE  
4 B, Yevhena Sverstyuka Str.  
**UA-02002 Kiev**  
Phone: +380 (0)44 / 494 33 44  
Fax: +380 (0)44 / 494-33-66

## EURASIAN REPRESENTATIVES

TOO Kazpromavtomatika KAZAKHSTAN  
UL. ZHAMBYLA 28  
**KAZ-100017 Karaganda**  
Phone: +7 7212 / 50 10 00  
Fax: +7 7212 / 50 11 50

## MIDDLE EAST REPRESENTATIVE

EIM Energy EGYPT  
3 Romy Square  
**ET-11341 Heliopolis, Cairo**  
Phone: +202 24525559  
Fax: +202 245266116  
SHERF Motion Techn. Ltd. ISRAEL  
Rehov Hamerkava 19  
**IL-58851 Holon**  
Phone: +972 (0)3 / 559 54 62  
Fax: +972 (0)3 / 556 01 82

CEG LIBAN LEBANON  
Cebaco Center/Block A Autostrade  
DORA  
**Lebanon-Beirut**  
Phone: +961 (0)1 / 240 445  
Fax: +961 (0)1 / 240 193

## AFRICAN REPRESENTATIVE

ADROIT TECHNOLOGIES SOUTH AFRICA  
20 Waterford Office Park 189 Witkoppen Road  
**ZA-Fourways**  
Phone: +27 (0)11 / 658 8100  
Fax: +27 (0)11 / 658 8101

# MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BUILDING 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN