



AbN  
automation



# 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.

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# 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

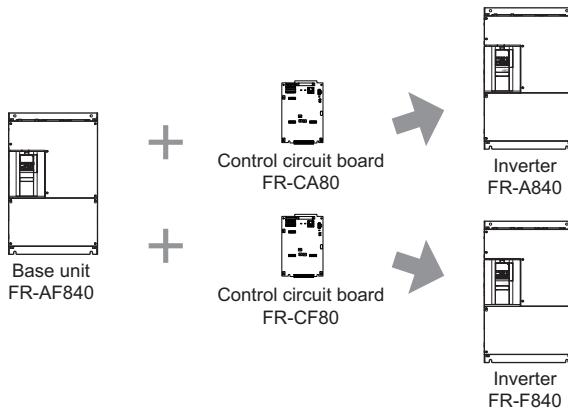
The FR-AF800 is a base unit of the inverter.

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.

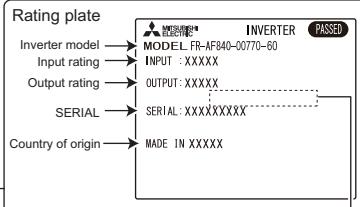
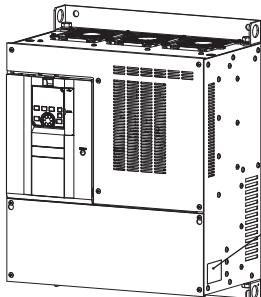
# 3 Product Check

## ● 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				

FR - AF 8 **20** - 00770 - 60

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



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-AF8[]-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	-

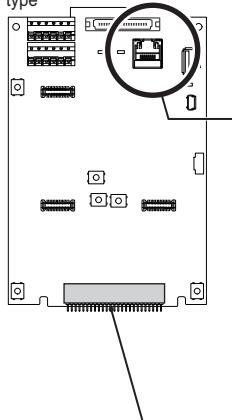
FR - CA80 - 01 - E1 - 60

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

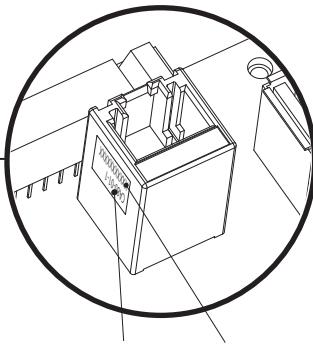
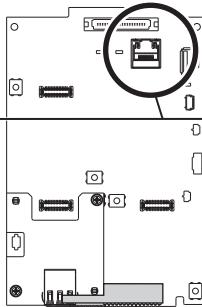
Symbol	Type
1	FM
2	CA
3	CA3

Symbol	Circuit board coating
60	With

RS-485 communication type



Ethernet type



Control circuit board model

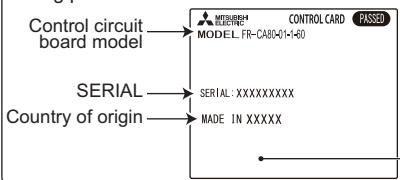
SERIAL

### 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



### 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-[]-E[]-I <b>A800</b> FR-CF80-[]-E[]-I <b>F800</b> FR-CA80-[]-E[]-I-60 <b>CC-Link IE Field Basic A800-E</b> FR-CF80-[]-E[]-I-60 <b>CC-Link IE Field Basic 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[]-I , the FR-CA80-[]-G[]-I and the FR-CF80-[]-E[]-I, three mounting screws are supplied.
- \*2 For the FR-CA80-[]-E[]-I , the FR-CA80-[]-G[]-I and the FR-CF80-[]-E[]-I, 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

## ●Changover 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		□91○○○○○ or later
Control circuit board	Made in Japan	□86○○○○○ or later
Base unit		□92○○○○○ or later
Control circuit board	Made in China	□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>	
				Manual name	Manual number
FR-A820-[I-1-60]	01540 to 03160	FR-APF820-[I-60]	FR-CA80-01-1-60		
FR-A820-[I-1-U6]	03800, 04750	FR-APF820-[I-U6]	FR-CA80-02-1-60		
FR-A840-[I-1-60]	00770 to 01800	FR-APF840-[I-60]	FR-CA80-01-1-60	A800 INSTRUCTION MANUAL (STARTUP)	IB-0600493 or IB-0600955ENG
FR-A840-[I-1-U6]	02160 to 06830	FR-APF840-[I-U6]	FR-CA80-02-1-60		BKO-CA2250 or BKO-CA2898
FR-A840-[I-2-60]	00770 to 01800	FR-APF840-[I-60]	FR-CA80-01-2-60		
	02160 to 06830		FR-CA80-02-2-60		
FR-A842-[I-1-U6]	07700 to 12120	FR-APF842-[I-U6]	FR-CA80-02-1-60	FR-A802 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600534ENG
FR-A842-[I-2-60]		FR-APF842-[I-60]	FR-CA80-02-2-60		
FR-A860-[I-1-60]	00680, 01080	FR-APF860-[I-60]	FR-CA80-01-1-60	FR-A860 (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-0600562ENG
	01440 to 04420		FR-CA80-02-1-60		
FR-A862-[I-1-60]	05450 to 08500	FR-APF862-[I-60]	FR-CA80-02-1-60	FR-A862 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600571ENG
FR-A820-[I-E1-60]	01540 to 03160	FR-APF820-[I-60]	FR-CA80-01-1-E1-60		
FR-A820-[I-E1-U6]	03800, 04750	FR-APF820-[I-U6]	FR-CA80-02-E1-60		
FR-A840-[I-E1-60]	00770 to 01800	FR-APF840-[I-60]	FR-CA80-01-1-E1-60	A800-E INSTRUCTION MANUAL (STARTUP)	IB-0600626
FR-A840-[I-E1-U6]	02160 to 06830	FR-APF840-[I-U6]	FR-CA80-02-E1-60		BKO-CA2486
FR-A840-[I-E2-60]	00770 to 01800	FR-APF840-[I-60]	FR-CA80-01-E2-60		
	02160 to 06830		FR-CA80-02-E2-60		
FR-A842-[I-E1-U6]	07700 to 12120	FR-APF842-[I-U6]	FR-CA80-02-E1-60	FR-A802-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600631ENG
FR-A842-[I-E2-60]		FR-APF842-[I-60]	FR-CA80-02-E2-60		
FR-A860-[I-E1-60]	00680, 01080	FR-APF860-[I-60]	FR-CA80-01-1-E1-60	FR-A860 (600V CLASS SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-0600638ENG
	01440 to 04420		FR-CA80-02-E1-60		
FR-A862-[I-E1-60]	05450 to 08500	FR-APF862-[I-60]	FR-CA80-02-E1-60	FR-A862-F (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600639ENG

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>④</sup>
				Manual name	Manual number	
FR-F820-[I]-E3-60-1	01540 to 03160	FR-AF820-[I]-60	FR-CF80-01-3-60	F800 INSTRUCTION MANUAL (STARTUP)	IB-0600545 or IB-0600955ENG	BKO-CA2336 or BKO-CA2898
FR-F820-[I]-U6-1	03800, 04750	FR-AF820-[I]-U6	FR-CF80-01-2-60			
FR-F840-[I]-2-60	00770 to 06830	FR-AF840-[I]-60	FR-CF80-01-2-60			
FR-F840-[I]-3-60-1	00770 to 01800	FR-AF840-[I]-U6	FR-CF80-01-3-60			
FR-F840-[I]-3-U6-1	02160 to 06830	FR-AF840-[I]-U6	FR-CF80-01-3-60			
FR-F842-[I]-2-60	07700 to 12120	FR-AF842-[I]-60	FR-CF80-01-2-60	FR-F802 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600550ENG	
FR-F842-[I]-3-U6-1	00680, 01080	FR-AF842-[I]-U6	FR-CF80-01-3-60	FR-F800 (600V CLASS) SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-0600690ENG	
FR-F860-[I]-3-60-1	01440 to 04420	FR-AF860-[I]-60	FR-CF80-01-3-60	FR-F882 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600689ENG	BKO-CA2548
FR-F862-[I]-3-60-1	05450 to 08500	FR-AF862-[I]-60	FR-CF80-01-3-60	FR-F882 (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600689ENG	
FR-F820-[I]-E3-60-2	01540 to 03160	FR-AF820-[I]-60	FR-CF80-01-E3-60	F800-E INSTRUCTION MANUAL (STARTUP)	IB-0600643	
FR-F820-[I]-E3-U6-2	03800, 04750	FR-AF820-[I]-U6	FR-CF80-01-E2-60			
FR-F840-[I]-E2-60	00770 to 06830	FR-AF840-[I]-60	FR-CF80-01-E2-60			
FR-F840-[I]-E3-60-2	00770 to 01800	FR-AF840-[I]-U6	FR-CF80-01-E3-60			
FR-F840-[I]-E3-U6-2	02160 to 06830	FR-AF840-[I]-U6	FR-CF80-01-E3-60			
FR-F842-[I]-E2-60	07700 to 12120	FR-AF842-[I]-U6	FR-CF80-01-E2-60	FR-F802-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600684-8ENG	
FR-F842-[I]-E3-U6-2	00680, 01080	FR-AF860-[I]-60	FR-CF80-01-E3-60	FR-F880-E (600V CLASS) SPECIFICATION INVERTER) INSTRUCTION MANUAL (STARTUP)	IB-0600681ENG	
FR-F860-[I]-E3-60	01440 to 04420	FR-AF862-[I]-60	FR-CF80-01-E3-60	FR-F882-E (SEPARATED CONVERTER TYPE) INSTRUCTION MANUAL (HARDWARE)	IB-0600682ENG	BKO-CA2564
FR-F862-[I]-E3-60	05450 to 08500	FR-AF862-[I]-U6				

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-[]-G1-60	01540 to 03160	FR-AF820-[]-60	FR-CA80-01-G1-60	FR-A800-F/G INSTRUCTION MANUAL (STARTUP)	IB-0600941	BK0-CA2940
FR-A820-[]-G1-U6	03500 04750	FR-AF820-[]-U6	FR-CA80-02-G1-60	FR-A800-F/G INSTRUCTION MANUAL (STARTUP)	IB-0600941	
FR-A840-[]-G1-60	00770 to 01800	FR-AF840-[]-60	FR-CA80-01-G1-60	FR-A800-F/G INSTRUCTION MANUAL (STARTUP)	IB-0600941	BK0-CA2940
FR-A840-[]-G1-U6	02160 to 06830	FR-AF840-[]-U6	FR-CA80-02-G1-60	FR-A800-F/G INSTRUCTION MANUAL (STARTUP)	IB-0600941	
FR-A840-[]-G2-60	00770 to 01800	FR-AF840-[]-60	FR-CA80-01-G2-60	FR-A800-F/G INSTRUCTION MANUAL (STARTUP)	IB-0600941	BK0-CA2940
FR-A842-[]-G1-U6	02160 to 06830	FR-AF842-[]-U6	FR-CA80-02-G2-60	FR-A800-F/G INSTRUCTION MANUAL (STARTUP)	IB-0600941	
FR-A842-[]-G2-60	007700 to 12120	FR-AF842-[]-60	FR-CA80-02-G2-60	FR-A800-F/G INSTRUCTION MANUAL (HARDWARE)	IB-0600978ENG	BK0-CA2940
				FR-A800-F/G INSTRUCTION MANUAL (HARDWARE)	IB-0600978ENG	

\*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.

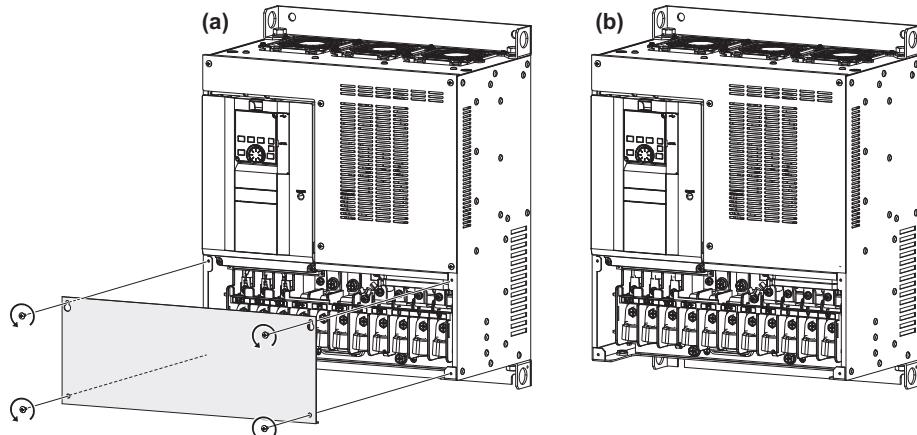


- If a combination of the base unit and control circuit board is not correct, an inverter fault (E.PE2) occurs, disabling the inverter operation.

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

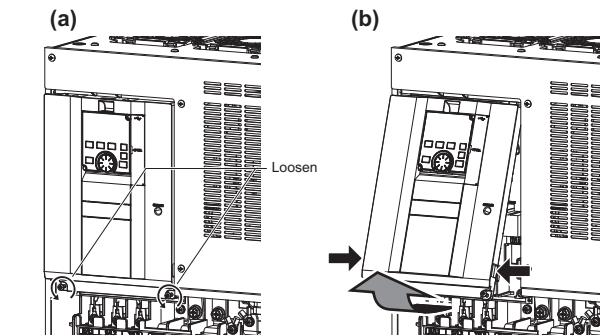
# 4 Setting Up

## ◆ 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)

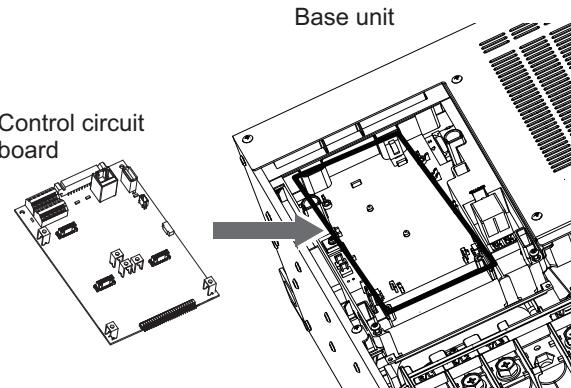


- (a) With the front cover (lower side) removed, loosen the mounting screws on the front cover (upper side). (These screws cannot be removed.)
- (b) Holding the areas around the installation hooks on the sides of the front cover (upper side), pull out the cover using its upper side as a support.

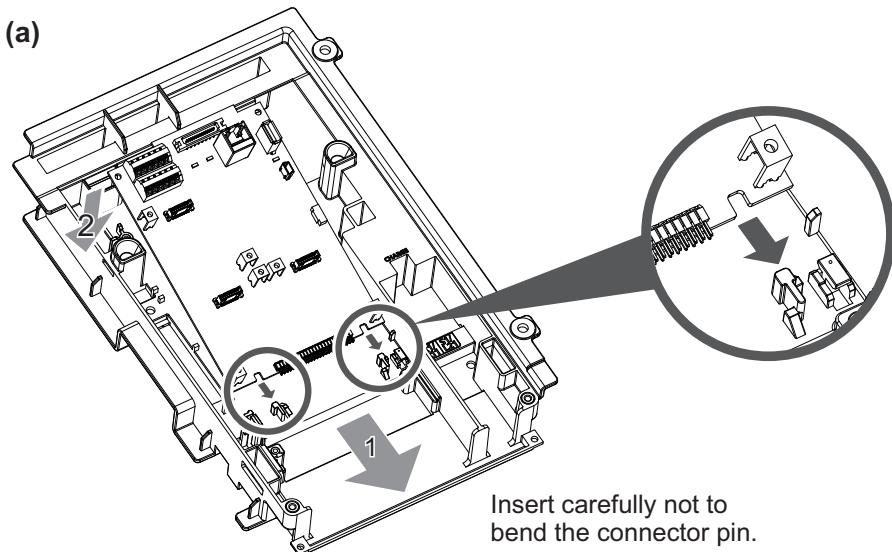
## ◆Installing a control circuit board on a base unit

Install the control circuit board to the base unit.

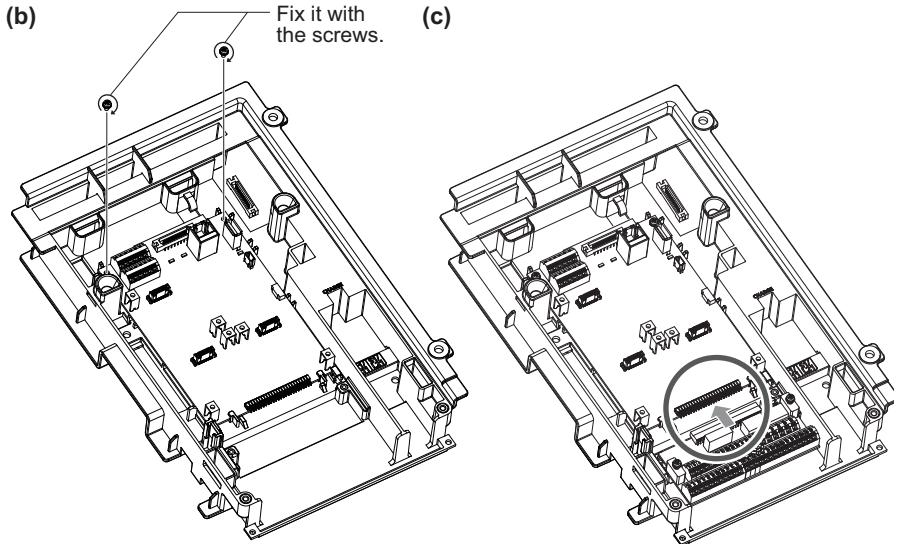
Remove a sponge for protecting the connector pin of the control circuit terminals.



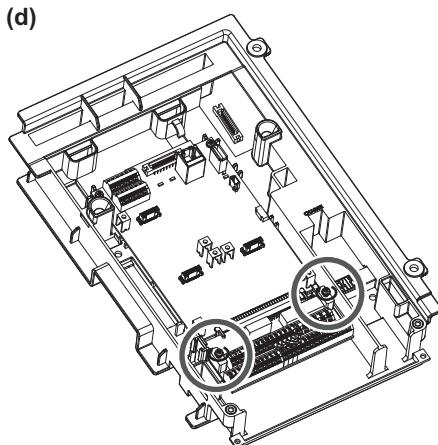
Install the control circuit board according to the following steps.



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



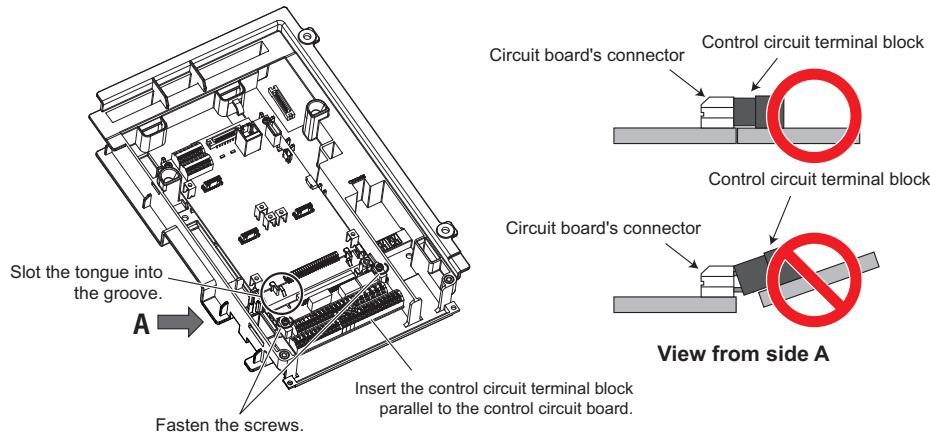
- (b) Fix it to the base unit with the supplied mounting screws.
- (c) Be careful not to bend the pins of the inverter control circuit connector when installing the control circuit terminal block.



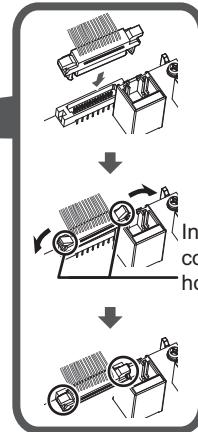
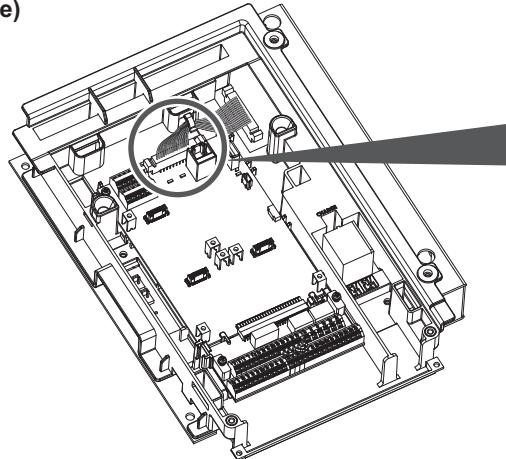
- (d) Tighten the screws on the control terminal block unit to fix it to the base unit.

## 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)

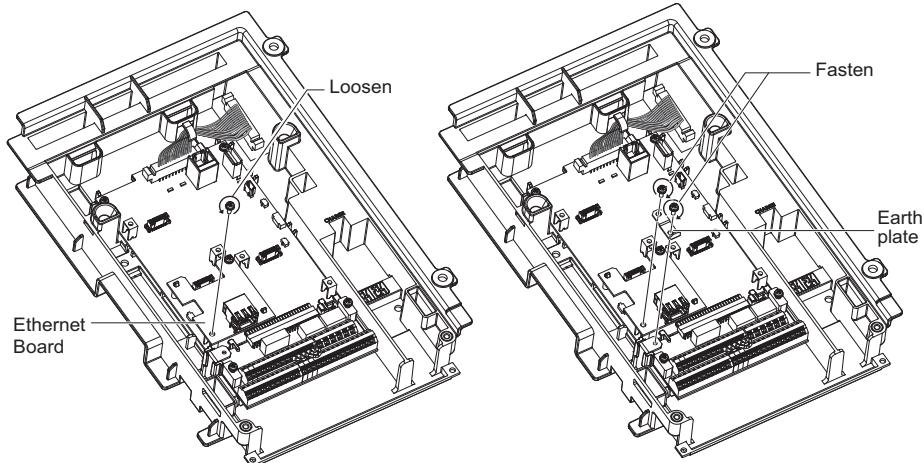


Insert the cable side connector until these hooks become level.

(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.

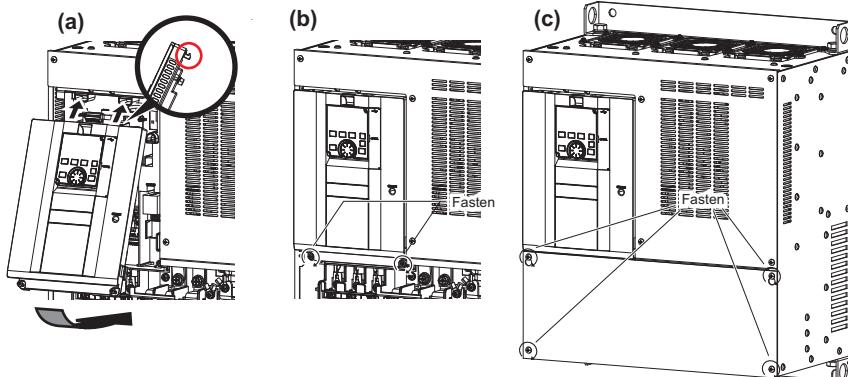


(f) Remove the mounting screw on the bottom left of the Ethernet board before installing the Ethernet board earth plate to the base unit.

## 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



- (a) 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.
- (b) Tighten the mounting screw(s) at the lower part of the front cover (upper side).
- (c) Fasten the front cover (lower side) with the mounting screws.

## NOTE

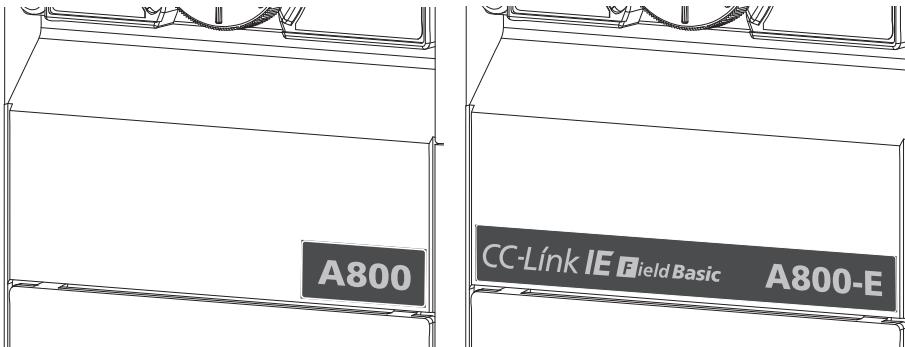
- Fully make sure that the front covers are installed securely. Always tighten the mounting screws of the front covers.

## ◆ 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 So(SO)	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
24 VDC power fault	E.P24	Magnetic pole position unknown	E.MP
Safety circuit fault	E.SAF	CPU fault	E.CPU 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.



- 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.

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### 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.

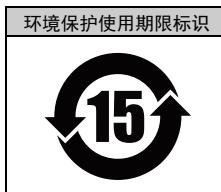
# Restricted Use of Hazardous Substances in Electronic and Electrical Products

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 <sup>*2</sup>	有害物质 <sup>*1</sup>					
	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.

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## 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

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# AbN

## automation

### 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 • Inverter/converter switching • Safety Integrity Level (SIL) 3 • Referenced Standard (Requirement of Chinese standardized law)
Jul. 2020	IB(NA)-0600687ENG-C	Edited • Combination of the inverter and the Instruction Manual
Dec. 2021	IB(NA)-0600687ENG-D	Added • FR-A800-G
Sep. 2023	IB(NA)-0600687ENG-E	Added • FR-CA80-01-G1-60 • FR-CA80-02-G1-60
Oct. 2024	IB(NA)-0600687ENG-F	Added • Internal storage device fault (E.PE6) Edited • Combination of the inverter and the Instruction Manual • Operation check for the safety stop function

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Mitsubishi Electric Automation, Inc. <b>USA</b> 500 Corporate Woods Parkway <b>Vernon Hills, IL 60061</b> Phone: +1 (847) 478-2100 Fax: +1 (847) 478-0328	HEAD OFFICE: TOKYO BUILDING 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN	Specifications subject to change without notice.	

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