



# INVERTER

Plug-in option

## FR-A8AL

# INSTRUCTION MANUAL

*Orientation control*

*Encoder feedback control*

*Vector control*

*Position control*

*Encoder pulse dividing output*

PRE-OPERATION INSTRUCTIONS	1
INSTALLATION	2
ENCODER SPECIFICATIONS AND PARAMETER SETTINGS	3
ORIENTATION CONTROL	4
ENCODER FEEDBACK CONTROL	5
VECTOR CONTROL	6
POSITION CONTROL FUNCTION	7
ENCODER PULSE DIVIDING OUTPUT	8

Thank you for choosing this Mitsubishi inverter plug-in option.

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

Please forward this Instruction Manual to the end user.

### Safety instructions

Do not attempt to install, operate, maintain or inspect the product until you have read through this Instruction Manual and appended documents carefully and can use the equipment correctly. Do not use this product 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".



**Warning**

Incorrect handling may cause hazardous conditions, resulting in death or severe injury.



**Caution**

Incorrect handling may cause hazardous conditions, resulting in medium or slight injury, or may cause only material damage.



**Caution**

The **Caution** level may even lead to a serious consequence according to conditions. Both instruction levels must be followed because these are important to personal safety.

#### ◆ Electric Shock Prevention



**Warning**

- While the inverter power is ON, do not open the front cover or the wiring cover. Do not run the inverter with the front cover or the wiring cover removed. Otherwise you may access the exposed high voltage terminals or the charging part of the circuitry and get an electric shock.
- Do not remove the inverter front cover even if the power supply is disconnected. The only exception for this would be when performing wiring and periodic inspection. You may accidentally touch the charged inverter circuits and get an electric shock.
- Before wiring or inspection, LED indication of the inverter unit operation panel must be switched OFF. Any person who is involved in wiring or inspection shall wait for at least 10 minutes after the power supply has been switched OFF and check that there is no residual voltage using a tester or the like. For some time after the power-OFF, a high voltage remains in the smoothing capacitor, and it is dangerous.
- Any person who is involved in wiring or inspection of this equipment shall be fully competent to do the work.
- The plug-in option must be installed before wiring. Otherwise you may get an electric shock or be injured.
- Do not touch the plug-in option or handle the cables with wet hands. Otherwise you may get an electric shock.
- Do not subject the cables to scratches, excessive stress, heavy loads or pinching. Otherwise you may get an electric shock.

#### ◆ Injury Prevention



**Caution**

- The voltage applied to each terminal must be the ones specified in the Instruction Manual. Otherwise a burst, damage, etc. may occur.
- The cables must be connected to the correct terminals. Otherwise a burst, damage, etc. may occur.
- The polarity (+ and -) must be correct. Otherwise a burst or damage may occur.
- While power is ON or for some time after power OFF, do not touch the inverter as it will be extremely hot. Touching these devices may cause a burn.

#### ◆ Additional Instructions

The following instructions must be also followed. If the product is handled incorrectly, it may cause unexpected fault, an injury, or an electric shock.

### Caution

#### Transportation and mounting

- Do not install or operate the plug-in option if it is damaged or has parts missing.
- Do not stand or rest heavy objects on the product.
- The mounting orientation must be correct.
- Foreign conductive objects must be prevented from entering the inverter. That includes screws and metal fragments or other flammable substance such as oil.
- If halogen-based materials (fluorine, chlorine, bromine, iodine, etc.) infiltrate into a Mitsubishi product, the product will be damaged. Halogen-based materials are often included in fumigant, which is used to sterilize or disinfest wooden packages. When packaging, prevent residual fumigant components from being infiltrated into Mitsubishi products, or use an alternative sterilization or disinfection method (heat disinfection, etc.) for packaging. Sterilization or disinfection of wooden package should also be performed before packaging the product.

#### Trial run

- Before starting operation, each parameter must be confirmed and adjusted. A failure to do so may cause some machines to make unexpected motions.

### Warning

#### Usage

- Do not modify the equipment.
- Do not perform parts removal which is not instructed in this manual. Doing so may lead to fault or damage of the product.

### Caution

#### Usage

- When parameter clear or all parameter clear is performed, the required parameters must be set again before starting operations. Because all parameters return to their initial values.
- Static electricity in your body must be discharged before you touch the product.

#### Maintenance, inspection and parts replacement

- Do not carry out a megger (insulation resistance) test.

#### Disposal

- The product must be treated as industrial waste.

### General instruction

- Many of the diagrams and drawings in this Instruction Manual show the inverter without a cover or partially open for explanation. Never operate the inverter in this manner. The cover must be reinstalled and the instructions in the Instruction Manual must be followed when operating the inverter.

— CONTENTS —

<b>1</b>	<b>PRE-OPERATION INSTRUCTIONS</b>	<b>6</b>
<b>1.1</b>	<b>Unpacking and product confirmation</b>	<b>6</b>
1.1.1	Product confirmation	6
1.1.2	SERIAL number check	7
<b>1.2</b>	<b>Component names</b>	<b>8</b>
<b>2</b>	<b>INSTALLATION</b>	<b>9</b>
<b>2.1</b>	<b>Pre-installation instructions</b>	<b>9</b>
<b>2.2</b>	<b>Installation procedure</b>	<b>10</b>
<b>2.3</b>	<b>Encoder specification / terminating resistor switch setting</b>	<b>13</b>
<b>2.4</b>	<b>Wiring</b>	<b>15</b>
<b>2.5</b>	<b>Encoder cables dedicated to Mitsubishi motors</b>	<b>19</b>
<b>2.6</b>	<b>Terminals</b>	<b>21</b>
<b>3</b>	<b>ENCODER SPECIFICATIONS AND PARAMETER SETTINGS</b>	<b>25</b>
<b>3.1</b>	<b>Encoder</b>	<b>25</b>
<b>3.2</b>	<b>Parameter setting</b>	<b>27</b>
3.2.1	Parameter for encoder	27
3.2.2	Parameter settings for the motor under vector control	29
<b>4</b>	<b>ORIENTATION CONTROL</b>	<b>30</b>
<b>4.1</b>	<b>Wiring example</b>	<b>30</b>
<b>4.2</b>	<b>Terminals</b>	<b>32</b>

<b>4.3</b>	<b>Machine end simple orientation control .....</b>	<b>33</b>
<b>4.4</b>	<b>Specifications.....</b>	<b>34</b>
<b>5</b>	<b>ENCODER FEEDBACK CONTROL .....</b>	<b>35</b>
<b>5.1</b>	<b>Wiring examples .....</b>	<b>35</b>
<b>5.2</b>	<b>Specifications.....</b>	<b>36</b>
<b>6</b>	<b>VECTOR CONTROL .....</b>	<b>37</b>
<b>6.1</b>	<b>Wiring examples .....</b>	<b>37</b>
<b>6.2</b>	<b>Pulse train torque command .....</b>	<b>40</b>
6.2.1	Parameter list .....	40
6.2.2	Pulse train torque command.....	41
<b>6.3</b>	<b>Specifications.....</b>	<b>42</b>
<b>7</b>	<b>POSITION CONTROL FUNCTION .....</b>	<b>43</b>
<b>7.1</b>	<b>Position control.....</b>	<b>43</b>
<b>7.2</b>	<b>Wiring example .....</b>	<b>46</b>
<b>7.3</b>	<b>Operation .....</b>	<b>47</b>
<b>7.4</b>	<b>Interface of the positioning module and inverter .....</b>	<b>50</b>
<b>7.5</b>	<b>Parameter setting and details.....</b>	<b>51</b>
7.5.1	Block diagram.....	51
7.5.2	Selection of control method (Pr. 800).....	51
7.5.3	Position control .....	52
7.5.4	Troubleshooting.....	54
<b>7.6</b>	<b>Specifications.....</b>	<b>55</b>



<b>8</b>	<b>ENCODER PULSE DIVIDING OUTPUT</b>	<b>56</b>
<b>8.1</b>	<b>Wiring example .....</b>	<b>56</b>
<b>8.2</b>	<b>Parameter related to encoder pulse dividing output.....</b>	<b>58</b>

# 1 PRE-OPERATION INSTRUCTIONS

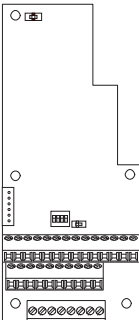
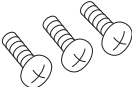
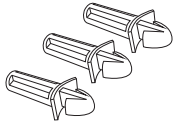
## 1.1 Unpacking and product confirmation

Take the plug-in option out of the package, check the product name, and confirm that the product is as you ordered and intact. This product is a plug-in option dedicated for the FR-A800 series.

### 1.1.1 Product confirmation

#### ◆ Product confirmation

Check the enclosed items.

Plug-in option.....1 	Mounting screw (M3 × 8 mm)....3 (Refer to <a href="#">page 10</a> ) 	Spacer.....3 (Refer to <a href="#">page 10.</a> ) 
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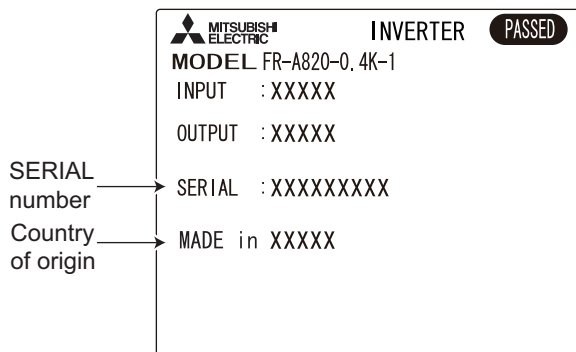
#### NOTE

- Connection diagrams in this Instruction Manual appear with the control logic of the input terminals as sink logic, unless otherwise specified. (For the control logic, refer to the Instruction Manual(Detailed) of the inverter.)

## 1.1.2 SERIAL number check

The FR-A8AL can be used for the inverter models listed below with the following SERIAL number or later. Check the SERIAL number indicated on the inverter rating plate or package. For the location of the rating plate, refer to the Instruction Manual (Detailed) of the inverter.

Rating plate example



□    ○    ○    ○ ○ ○ ○  
 Symbol   Year   Month   Control number  


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 SERIAL

The SERIAL consists of one symbol, two characters indicating the production year and month, and six characters indicating the control number.

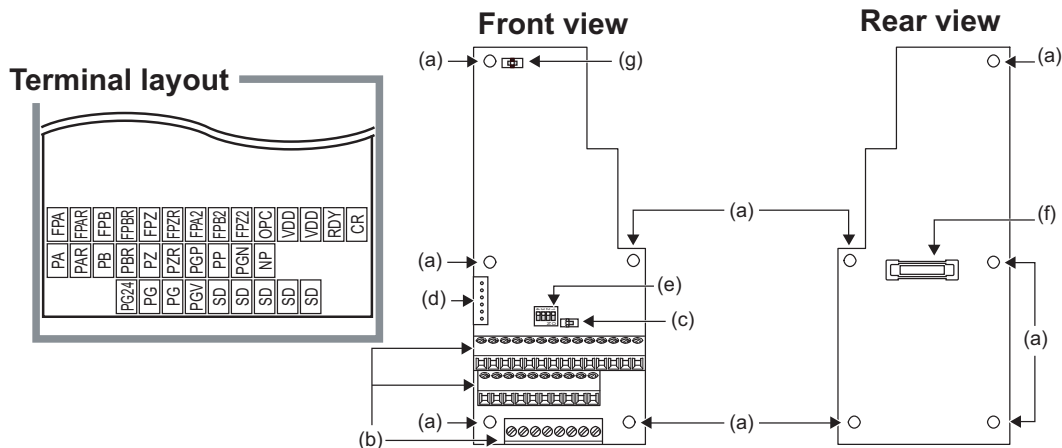
The last digit of the production year is indicated as the Year, and the Month is indicated by 1 to 9, X (October), Y (November), or Z (December).

- FR-A800 series

Model	Country of origin indication	SERIAL number
FR-A820-00046(0.4K) to 04750(90K) FR-A840-00023(0.4K) to 06830(280K) FR-A842-07700(315K) to 12120(500K) FR-A846-00023(0.4K) to 00470(18.5K)	MADE in Japan	□58○○○○○○ or later
	MADE in China	□59○○○○○○ or later



## 1.2 Component names



Symbol	Name	Description	Refer to page
a	Mounting hole	Fixes the option to the inverter with screws, or installs spacers.	10
b	Terminal block	Connects to the encoder.	15
c	Encoder type selection switch (SW3)	Switches the encoder type (differential line driver/ complementary).	13
d	CON2 connector	Connector for the FR-A8NS (SSCNET III) connection	—
e	Terminating resistor selection switches (SW2-1 to SW2-3)	Switches ON or OFF the internal terminating resistor.	13
	Encoder power supply selection switch (SW2-4)	Switches the voltage supplied to the encoder from terminal PGV.	
f	Connector	Connects to the option connector of the inverter.	10
g	Switch for manufacturer setting (SW1)	Do not change the initially-set status ( <input type="checkbox"/> ).	—

## **2** INSTALLATION

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### **2.1 Pre-installation instructions**

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Check that the inverter's input power and the control circuit power are both OFF.

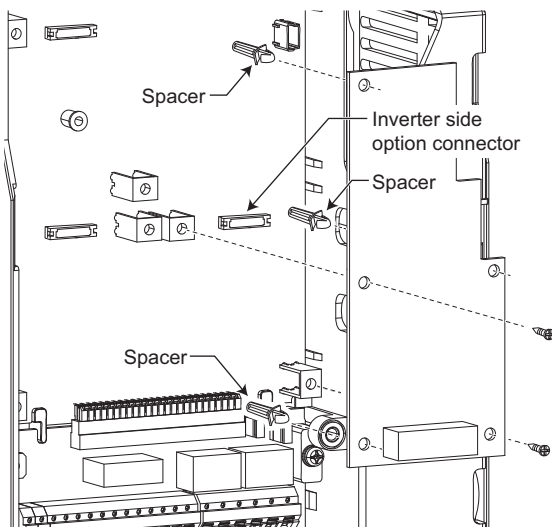


#### **Caution**

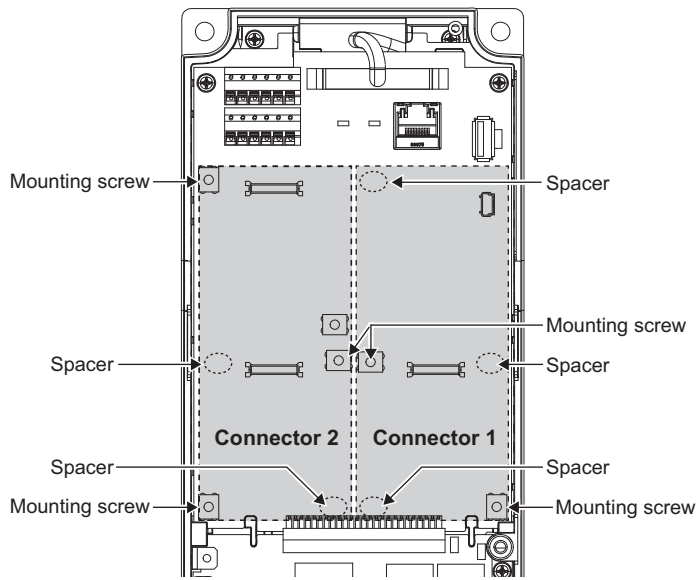
- With input power ON, do not install or remove the plug-in option. Otherwise, the inverter and plug-in option may be damaged.
- To avoid damage due to static electricity, static electricity in your body must be discharged before you touch the product.

## 2.2 Installation procedure

- (1) Remove the inverter front cover. (Refer to Chapter 2 of the Instruction Manual (Detailed) of the inverter for details on how to remove the front cover.)
- (2) As shown in the next page, when the plug-in option is installed to the connector 1, insert spacers in the three mounting holes that will not be tightened with mounting screws. (When the plug-in option is installed to the connector 2, insert spacers in the two mounting holes.)
- (3) Fit the connector of the plug-in option to the guide of the connector on the inverter unit side, and insert the plug-in option as far as it goes.
- (4) When the plug-in option is installed to the connector 1, fit the two locations, the left and right, of the product securely to the inverter unit by screwing in the supplied mounting screws. (When the plug-in option is installed to the connector 2, fit the three locations.) (tightening torque 0.33 N·m to 0.40 N·m) If the screw holes do not line up, the connector may not be inserted deep enough. Check the connector.



Example of installation to connector 1



**Insertion positions for screws and spacers**

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