

E800-E



Thank you for choosing Mitsubishi Electric inverter. This Inverter Safety Guideline provides handling information and precautions for use of this product. Do not use this product until you have full knowledge of the product mechanism, safety information and

MITSUBISHI ELECTRIC CORPORATION

Transportation and installation

■ If halogens (including fluorine, chlorine, bromine, and iodine) contained in fumigants for wood packages enter this product, the product may be damaged Prevent the entry of fumigant residuals or use an alternative metfnod such as he disinfection. Note that sterilization or disinfection of wood packages should be performed before packing the product.

Viring
Do not install a power factor correction capacitor, surge absorber, or radio noise filter on the output side of this product. These devices may overheat or burn out. The output terminals (turninals U, v, and W) must be connected to a motor correctly. Otherwise the motor will rotate inversely.

Even with the power OFF, high voltage is still applied to the terminals U, V and W while the PM motor is running. Ensure the PM motor has stopped before carrying out any wiring. Otherwise you may get an electric shock.

Never connect a PM motor to a commercial power supply. Connecting a commercial power supply to the input terminals (U, V, W) of a PM motor will burn it out. The PM motor must be connected with the output terminals (U, V, W) of this product.

Before starting the operation, confirm or adjust the parameter settings. Failure to do so may cause some machines to make unexpected motions.

Usage

Stay away from the equipment after using the retry function in this product as the equipment will restart suddenly after the output shutoff of this product.

Access to the motor is allowed only after it is fully confirmed that the motor does

Access to the motor is allowed only after it is fully confirmed that the motor does not start running. Depending on the function settings of this product, the product does not stop its output even when the STOP/RESET key on the operation panel is pressed. To prepare for it, provide a separate circuit and switch (to turn OFF the power of this product, or apply a mechanical brake, etc.) for an emergency stop. Be sure to turn OFF the start (STF/STR) signal before clearing the fault as this Do not use a PM motor for an application that the motor may be driven by the load and run at a speed higher than the maximum motor speed. Use only a three-phase squirrel cage motor or PM motor as a load on this product. Connection of any other electrical equipment to the output of this product may damage the equipment. Do not remove any part which is not instructed to be removed in the Instruction Manuals. Doing so may lead to a failure or damage of this product.

nstalling the MC on the output side of the inverter, turn it ON/OFF while e inverter and motor are at a stop. schronic thermal OIL relay function may not be enough for protection of a rom overheating. It is recommended to install an external thermal relay for at order of the control of

Appropriate precautions must be taken to suppress harmonics. Otherwise power harmonics generated from this product may heat/damage a power factor correction capacition or a generate superior or agenerate content or a generate content or a generate content or take measures to suppress surge voltage. Otherwise surge voltage, which is attributed to the length and thickness of wire, may occur at the motor terminals, causing the motor insulation to deteriorate.

When a motor is driven by the inverter, axial voltage is generated on the motor shaft, which may cause electrical corrosion of the bearing. Take measures such as decreasing the carrier frequency.

As all parameters return to their initial values after Parameter clear or All As all parameters return to their initial values after Parameter clear or All As all parameters return to their initial values after Parameter clear or All This product can be easily set for high-speed operation. Therefore, consider all things related to the operation such as the performance of a motor and equipment in a system before the setting change.

If the machine must not be restarted when power is restored after a power failure, provide an MC on the input side of the inverter and also make up a sequence when the parameter of the transistor element of the inverter will repeat due to a repeated flow of large current, shortening the life.

Perform an inspection and test operation of this product if it has been stored for a long period of time.

Periori an inspection and uses uperation of imp product in this been stude to a long period of time.

To avoid dim a decharged before you touch this product.

Only one PM motor can be connected to a single until of this product.

A PM motor must be used under PM sensorless vector control. Do not use a synchronous motor, induction motor, or synchronous induction motor.

Do not connect a PM motor to this product with it set to the induction motor control setting (initial setting). Do not connect an induction motor to this product with it set to the PM sensorless vector control setting. Doing so will cause failure.

As a process of starting a PM motor, turn ON the power of this product first, and then close the contactor on the output side of this product.

In order to protect the inverter and the system against unauthorized access by external systems via network, take security measures that include firewall settings.

Settings.

Depending on the network environment, the inverter may not operate as intended due to delays or disconnection in communication. Carefully consider what type or environment this product will be used in and any safety issues related to its use.

product.

If the breaker installed on the input side of this product trips, check for wiring faults (such as short circuits) and damage to internal parts of this product, Identify and remove the cause of the trip before restting the tripped breaker and applying the power to the product again. When any protective function is activated, take an appropriate corrective action When any protective function is activated, take an appropriate corrective action laintenance, inspection and parts replacement.

Do not carry out at a meager (insulation resistance) test on the control circuit of this

For clarity, illustrations in this Safety Guideline may be drawn with covers or safety guards removed. Ensure all covers and safety guards are properly installed prior to starting operation. For details on the PM motor, refer to the Instruction Manual of the PM motor.

Emergency stop

A safety backup such as an emergency brake must be provided for devices or equipment in a system to prevent hazardous conditions in case of failure of this

start or stop this product with a magnetic contactor on its input y shorten the life of this product. ong so may shorten the life of this product, noise filter or other means to minimize electromagnetic interference with electronic equipment used nearby this product, or other product and the product of the product of

Please forward this Safety Guideline to the end user.

FR-E840-0016(0.4K) to 0170(7.5K)-E

FR-E820-0008(0.1K) to 0330(7.5K)-E

INVERTER SAFETY GUIDELINE



IB-0600860ENG-A(1912)IP Specifications subject to change without notice

Troluted mandalo	
Manual name	Manual number
FR-E800 Instruction Manual (Connection)	IB-0600865ENG
FR-E800 Instruction Manual (Function)	IB-0600868ENG
FR-E800 Instruction Manual (Communication)	IB-0600871ENG
FR-E800 Instruction Manual (Maintenance)	IB-0600874ENG

Manual name	Manual number
FR Configurator2 Instruction Manual	IB-0600516ENG
PLC Function Programming Manual	IB-0600492ENG
FR-E800 Instruction Manual (Functional safety)	BCN-A23488-000

↑ CAUTION

↑ CAUTION

Safety Information

Do not attempt to install, operate, maintain or inspect this product until you have read through this Safety Guideline and supplementary documents carefully to use the equipment correctly. Do not use the product until you have full knowledge of the product mechanism, safety information and instructions.

Installation, operation, maintenance and inspection must be performed by qualified personnel. Here, qualified personnel means a person who meets all the following conditions:

A person who possesses a certification in regard with electric appliance handling, or person took a proper engineering training. Such training may be available at your local Mitsublish Electric office. Contact your local sales office for schedules and locations.

A person who can access operating manuals for the protective devices (for example, light curtain) connected to the safety control system, or a person who has read these manuals thoroughly and familiarized themselves with the protective devices.

In this Safety Guideline, the safety instruction levels are classified into "WARNING" and "CAUTION".

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

CAUTION level may lead to a seriou Note that even the onsequence depending on conditions. Be sure to follow the structions of both levels as they are critical to personnel safety

Electric shock prevention

- Do not remove the front cover or the wiring cover while the power of this product is ON, and do not run this product with the front cover or the wiring cover removed, as the exposed high voltage terminals or the charging part of the circuitry can be touched. Doing so may cause an electric shock. Even if power is OFF, do not remove the front cover except for wiring or periodi inspection as the inside of this product is charged. Doing so may cause an electric shock.
- is ON, and do not run this product with the front cover or the wiring cover removed, as the exposed high voltage terminals or the charging part of the circuitry can be touched. Doing so may cause an electric shock. Even if power is OFF, do not remove the front cover except for wiring or periodic Even if power is OFF, do not remove the front cover except for wiring or periodic electric shock.

 Before wiring or inspection, check that the display of the operation panel is OFF. Any person who is involved in wiring or inspection shall wait for 10 minutes or longer after power OFF and check that there are no residual voltage using a digital multimeter or the like. The capacitor is charged with high voltage for some time after power OFF and it is dangerous. Earthing (grounding) must conform to the product must be earthed (grounded). Earthing (grounding) must conform to the conformation of the product of the product

- motor. This product body must be installed before wiring. Otherwise you may get an electric shock or be injured. Do not fuuch the keys with or strain of the product of t v. uit board or handle the cables with wet hands. Doing
- Fire prevention

↑ CAUTION

- This product must be installed on a nonflammable wall without holes in it so that its components cannot be touched from behind. Installing it on or near flammable material may cause a fire.

 If this product becomes faulty, the product power must be switched OFF. A continuous flow of large current may cause a fire.

 Do not connect a resistor directly to the DC terminals P/+ and N/-. Doing so could cause a fire.

 Across terminals P/+ and PR, connect only an external brake resistor.

 Be sure to perform daily and periodic inspections as specified in the Instruction Manual. There is a possibility of explosion, damage, or fire if this product is used without inspection.

Injury prevention **↑** CAUTION

- damage may occur.
 The polarity (+ and -) must be correct. Otherwise an explosion or damage may
- While power is ON or for some time after power OFF, do not touch the inverter a it will be extremely hot. Doing so may cause burns.

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 installation

 Use proper lifting techniques or a trolley when carrying products. Failure to do so may lead to injuries.

 Do not stack the boxes containing inverters higher than the number recommended
- ecommended.

 The product must be installed in a position where it withstands the weight of the product according to the information in the Instruction Manual.

- The product must be installed in a position where it withstands the weight of the product according to the information in the Instruction Manual. Do not install or operate this product if it is damaged or has parts missing. When carrying the inverter, do not hold it by the front cover. It may fall or break. Do not stand or place heavy objects on the product. Ensure the mounting orientation of this product is correct. Prevent conductive objects such as screws, metal fragments, and wire offcuts, or As this product is a precision instrument, do not drop or ster. As this product is a precision instrument, do not drop or subject it to impact. The surrounding air temperature must be between -20°C and +60°C (nonfreezing). The rated current must be reduced at a surrounding air temperature above 50°C. Otherwise this product may be damaged.

 The surrounding humidity must be 90% RH or less (non-condensing) for models without circuit board coaling and 95% RH or less (non-condensing) for models without circuit board coaling and 95% RH or less (non-condensing) for models without circuit board coaling and 95% RH or less (non-condensing) for models without circuit board coaling and 95% RH or less (non-condensing). The temporary storage femperature (applicable to a short limited time such as a transportation time) must be between -40°C and +70°C. Otherwise this product may be damaged.

 This product must be used indoors (without corrosive gas, flammable gas, oil mist, dust and dirt). Otherwise the product may be damaged. 5.9 m/s² at 10 to 55 Hz in X, Y, and Z directions. Otherwise the product may be

INVERTER INSTALLATION AND PRECAUTIONS

When installing the inverter on the enclosure surface, remove the fron

Install the inverter on a strong surface securely with screws.

cover and wiring cover to fix the inverter.

- Leave enough clearances and take cooling measures. Avoid places where the inverter is subjected to direct sunlight, high temperature
- and high humidity.
 Install the inverter on a nonflammable wall surface. When tightening screws into the upper mounting holes, tilt the screwdrive



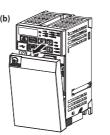
Allow clearance ↑ 10 cm \leftarrow 1 cm or more *1 10 cm √ or more

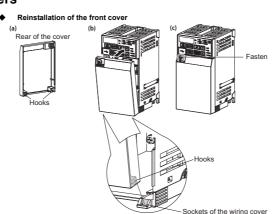
When using the inverters at the surrounding air temperature of 40°C or less, the inverters can be installed closely attached (0 cm clearance).

INSTALLATION AND WIRING

Removal and reinstallation of covers

Removal of the front cover



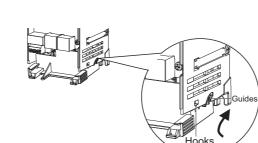


- (a) Loosen the mounting screws of the cover. (These screws cannot be $\,$
- (b) Pull out the cover using its lower side as a suppor With the cover removed, the control circuit terminals can be wired and the plug-in option can be installed.
- (a) Check the position of the hooks on the rear of the cover.

(b) Insert the hooks of the cover into the sockets of the wiring cover, and reinstall the $\,$ cover to the inverter.

(c) Tighten the mounting screws of the front cover. (Tightening torque: 0.6 to 0.8

♦ Removal of the wiring cover (for FR-E820-0050(0.75K) or ♦ Reinstallation of the wiring cover (for FR-E820-0050(0.75K) or



Pull out the cover along the guides in the direction shown by the arrow in the Fit the cover to the inverter along the guides

Removal of the wiring cover (for the FR-E820-0080(1.5K) or higher, or FR-E840-0016(0.4K) or higher)

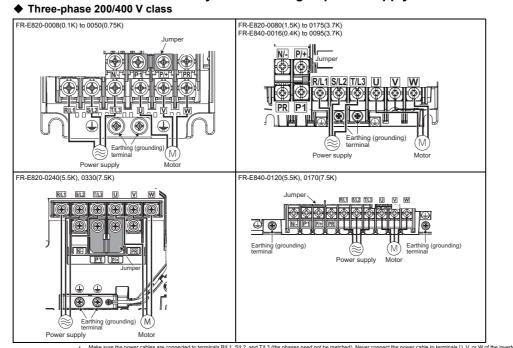




Fit the cover to the inverter along the guides, and push the hook into the socket

- (a) Insert a tool such as a flathead screwdriver into the half-hole above the "PUSH" mark on the wiring cover to push the cover behind the wiring
- cover approx. 3 mm. (b) Pull out the cover along the guides in the direction shown by the arrow in

2.2 Main circuit terminal layout and wiring to power supply and motor



Applicable cables and wiring length

Select cables of recommended gauge size to ensure that the voltage drop will be 2% or less. If the wiring distance is long between the inverter and motor, the voltage drop in the main circuit will cause the motor torque to decrease especially at a low speed The following table shows a selection example for the wiring length of 20 m at the ND rating. When using the inverter with the LD rating, refer to the FR-E800 Instruction

							Cable gauge									
Applicable Inverter	Terminal	Tightening	Crimp terminal		HIV cables, etc. (mm ²) *1			AWG *2		PVC cables, etc. (mm ²) *3		c. (mm²) *3				
model	screw size *4	torque N·m	R/L1, S/L2, T/L3	u, v, w	R/L1, S/L2, T/L3	u, v, w	Earthing (grounding) cable	R/L1, S/L2, T/L3	u, v, w	R/L1, S/L2, T/L3	u, v, w	Earthing (grounding) cable				
FR-E820-0008(0.1K) to 0050(0.75K)	M3.5	1.2	2-3.5	2-3.5	2	2	2	14	14	2.5	2.5	2.5				
FR-E820-0080(1.5K), 0110(2.2K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5				
FR-E820-0175(3.7K)	M4	1.5	5.5-4	5.5-4	3.5	3.5	3.5	12	12	4	4	4				
FR-E820-0240(5.5K)	M5	2.5	5.5-5	5.5-5	5.5	5.5	5.5	10	10	6	6	6				
FR-E820-0330(7.5K)	M5	2.5	14-5	8-5	14	8	5.5	6	8	16	10	6				
FR-E840-0016(0.4K) to 0095(3.7K)	M4	1.5	2-4	2-4	2	2	2	14	14	2.5	2.5	2.5				
FR-E840-0120(5.5K)	M4	1.5	5.5-4	2-4	3.5	2	3.5	12	14	4	2.5	4				
FR-E840-0170(7.5K)	M4	1.5	5.5-4	5.5-4	3.5	3.5	3.5	12	12	4	4	4				

The cable size is that of the HIV cable (600 V grade heat-resistant PVC insulated wire) etc. with continuous maximum permissible temperature of 75°C. It assumes a surrounding air temperature of 50°C or lower and the wiring distance of 20 m or shorter. The cable size is that of the THHV cable with continuous maximum permissible temperature of 75°C. It assumes a surrounding air temperature of 40°C or lower and the wiring distance of 20 m or shorter. (For use in the United States or Canada, refer to the section 72° historicor for UL and OLL.) and OLL.) are the cable size of Canada, refer to the section 72° historicor for UL and OLL.) are the cable size of Canada, refer to the section 72° historicor for UL and OLL.) are the cable size of Canada, refer to the section 72° historicor for UL and OLL.) are the cable size of Canada, refer to the section 72° historicor for UL and OLL.) are the cable size in the cable size is that of the HIV cable with continuous and the wiring distance of 20 m or shorter (selection examine mark) for use in Figure 32° historicor for UL and OLL.)

10 m (30 m) 25 m (100 m) 50 m (200 m) 75 m (300 m) 100 m (500 m)

Line voltage drop [V] = $\sqrt{3}$ × wire resistance [m Ω /m] × wiring distance [m] × current [A] / 1000 Use a larger diameter cable when the wiring distance is long or when it is desired to decrease the voltage drop (torque reduction) in the low speed range.

 Total wiring length Connect one or more motors within the total wiring length (sum of the wiring lengths of the motor and the inverter) shown in the following table.

0.1K 0.4K 1.5K 2.2K or higher 100 m (500 m) 100 m (500 m) 100 m (500 m) 75 m (300 m) 100 m (500 m) 50 m (200 m) 50 m (300 m) 75 m (500 m) 100 m (500 m) 100 m (500 m 25 m (100 m) 50 m (200 m) 75 m (300 m) 100 m (500 m) 100 m (500 m) 100 m (500 m) 10 m (30 m) (2 kHz) or higher

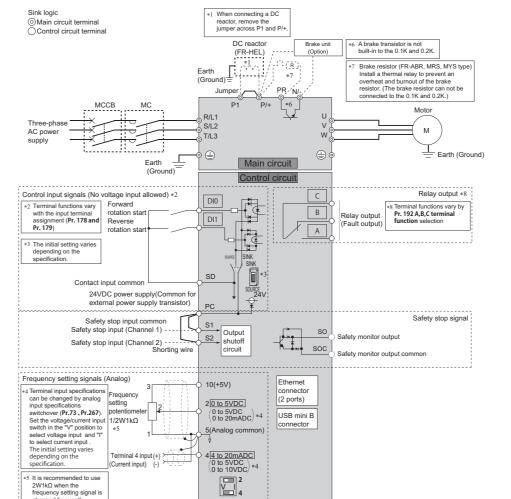
*1 The value in the parentheses is the total wiring length when unshielded cables are used.

When driving a 400 V class motor by the inverter, surge voltages attributable to the wiring constants may occur at the motor terminals, deteriorating the insulation of the motor. In this case, use a "400 V class inverter-driven insulation-enhanced motor" and set Pr.72 PWM frequency selection according to the wiring length: "14.5 kHz or less" when the wiring length is 50 m or shorter, "8 kHz or less" when the wiring length is from 50 m to 100 m, or "2 kHz or less" when the wiring length is longer than 100

Terminal connection diagram

Connector for

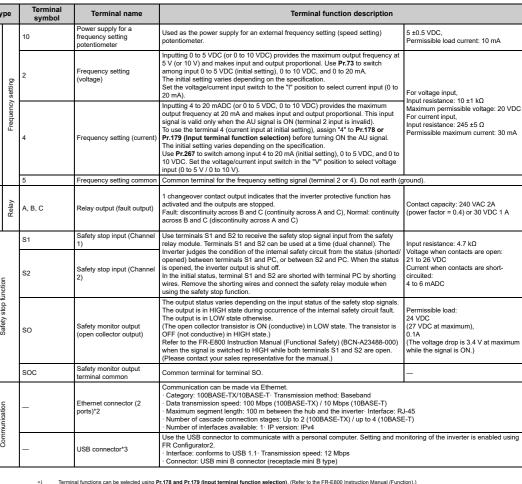
plug-in option connection



Details on the main circuit terminals and the control circuit terminals

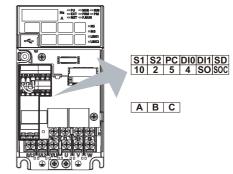
Option connector

Ту	ре	Terminal symbol	Terminal name	Terminal function description							
		R/L1, S/L2, T/L3	AC power input	Connected to the commercial power supply. Do not connect anything to these terminals when using the high power converter (FR-HC2) or the multifunction regeneration converter (FR-XC) in common bus regeneration mode.							
		U, V, W	Inverter output	Connected to a three-phase squirrel cag	e motor or a PM motor.						
		P/+, PR	Brake resistor connection	Connect an optional brake transistor (MI 0.2K.)	onnect an optional brake transistor (MRS, MYS, FR-ABR) between terminal P/+ a 2K.)						
	ain cuit	P/+, N/-	Brake unit connection	Connect the brake unit (FR-BU2, FR-BU converter (FR-HC2) to these terminals.	onnect the brake unit (FR-BU2, FR-BU, or BU), multifunction regeneration converter (FR-) inverter (FR-HC2) to these terminals.						
		P/+, P1	DC reactor connection	Remove the jumper across terminals P/- jumper across terminals P/+ and P1 sho	+ and P1, and connect a DC reactor. Whe uld not be removed.	n a DC reactor is not connected, the					
			Earth (ground)	For earthing (grounding) the inverter cha	assis. Be sure to earth (ground) the inverte	er.					
		DI0*1	Forward rotation start	Turn ON the DI0 signal to start forward rotation and turn it OFF to stop.	When the DI0 and DI1 signals are	Input resistance: 4.7 kΩ Voltage when contacts are open: 21 to 26 VDC					
		DI1*1 Reverse rotation start		Turn ON the DI1 signal to start reverse rotation and turn it OFF to stop.	Current when contacts are short- circuited: 4 to 6 mADC						
			Contact input common (sink) (initial setting)	Common terminal for the contact input to	t terminal (sink logic).						
ignal	input	SD	External transistor common (source)		ly common terminal of a transistor output ogic to avoid malfunction by undesirable o	of a transistor output (open collector output) device, such a ction by undesirable current.					
Input signal	Contact input		24 VDC power supply common	Common output terminal for 24 VDC 0.1	A power supply (terminal PC). Isolated fr	om terminals 5 and SE.					
_	0		External transistor common (sink) (initial setting)	Connect this terminal to the power suppl (open collector output) device, such as a logic to avoid malfunction by undesirable							
		PC	Safety stop input terminal common	Common terminal for safety stop input terminals Power supply voltage range 22 to 26.5 VDC							
			Contact input common (source)	Common terminal for the contact input to	erminal (source logic).	Permissible load current: 100 mA					
			24 VDC power supply common	Can be used as a 24 VDC 0.1 A power s	supply.]					



0.75 (for 2 wire

Control circuit terminal layout



Use crimp terminals and stripped wire for the control circuit wiring. If only a single wire is used, the wire can be stripped and used without a ferrule Connect the end of wires (crimp terminal or stranded wire) to the terminal block.

· Crimp terminals commercially available (as of December 2019.

Phoenix Contact Co., Ltd.

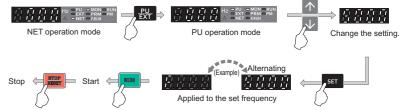
Wire gauge (mm²) With insulation sleeve AI 0,75-10GY

BASIC OPERATION

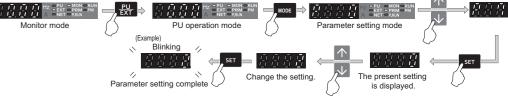
3.1 Components of the operation panel The operation panel cannot be removed from the inverter

Name	Description
PU/EXT key	Switches between the PU operation mode, the PUJOG operation mode, and the External operation mode.
MODE key	Switches the operation panel to a different mode.
SET key	Used to confirm each selection. Switches the monitor screen in the monitor mode.
RUN key	Start command The direction of motor rotation depends on the Pr.40 setting.
STOP/RESET key	Used to stop operation commands. Used to reset the inverter when the protective function is activated.
UP/DOWN key (↑↓)	Press this key to change the setting of frequency or parameter.
	PU/EXT key MODE key SET key RUN key STOP/RESET key UP/DOWN key

◆Starting/stopping the inverter on the operation panel



◆Parameter setting



4 PARAMETERS

For details, refer to the FR-E800 Instruction Manual (Function). The PDF manual can also be downloaded from the Mitsubishi Electric FA Global The PDF manual can also be downloaded from the Mitsubishi Electric FA Global







6 SPECIFICATIONS

6.1 Inverter rating

◆ Three-phase 200 V class

	-			8000	0015	0030	0050	0080	0110	0175	0240	0330			
	Model FR-	E820-[]		0.1K	0.2K	0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K			
Applic	able motor capa	acity	LD	0.2	0.4	0.75	1.1	2.2	3.0	5.5	7.5	11			
• •	(kW) *1	•	ND	0.1	0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5			
	Rated capacity	(kVA)	LD	0.5 0.8		1.4	2.4	3.8	4.8	7.8	12.0	15.9			
	*2		ND	0.3	0.6	1.2	2.0	3.2	4.4	7.0	9.6	13.1			
	Rated curren	t (A)	LD	1.3 (1.1)	2 (1.7)	3.5 (3.0)	6.0 (5.1)	9.6 (8.2)	12 (10.2)	19.6 (16.7)	30 (25.5)	40 (34)			
	*7		ND	0.8 (0.8)	1.5 (1.4)	3 (2.5)	5 (4.1)	8 (7)	11 (10)	17.5 (16.5)	24 (23)	33 (31)			
Output	Overload cur		LD	120% 60	120% 60 s, 150% 3 s (inverse-time characteristics) at surrounding air temperature of 50°C										
	rating *3		ND	150% 60	s, 200% 3	s (inverse	time chara	cteristics)	at surroun	ding air ter	mperature	of 50°C			
	Vo	Itage *4	ı	Three-ph	ase 200 to	240 V									
	Regenerative Max braking		e transistor	Not instal	led	Built-in									
			imum brake rque (ND erence) *5	150%		100%		50% 20%							
	Rated input A	Rated input AC voltage/frequency			Three-phase 200 to 240 V 50/60 Hz										
	Permissible AC voltage fluctuation			170 to 26	170 to 264 V, 50/60 Hz										
	Permissible frequency fluctuati			±5%											
	Rated input	LD	Without DC reactor	1.9	3.0	5.1	8.2	13	16	26	37	49			
		LD	With DC reactor	1.3	2.0	3.5	6.0	9.6	12	20	30	40			
Power	current (A) *8	ND	Without DC reactor	1.4	2.3	4.5	7.0	11	15	23	30	41			
supply		ND	With DC reactor	0.8	1.5	3.0	5.0	8.0	11	17.5	24	33			
		LD	Without DC reactor	0.7	1.1	1.9	3.1	4.8	6.2	9.7	14	19			
	Power supply capacity	LD	With DC reactor	0.5	0.8	1.3	2.3	3.7	4.6	7.5	11	15			
	(kVA) *6	ND	Without DC reactor	0.5	0.9	1.7	2.7	4.1	5.7	8.8	12	16			
		ND	With DC reactor	0.3	0.6	1.1	1.9	3.0	4.2	6.7	9.1	13			
Pr	rotective structu	re (IEC	60529)	Enclosed	type (IP20))									
Cooling system				Natural				Forced ai	r						
	Approx. ma	0.5	0.5 0.5 0.7 1.0 1.4 1.4 1.8 3.3					3.3	3.3						

♦ Three-phase 400 V class

	Madalas	0016	0026	0040	0060	0095	0120	0170				
	Model FR-	E840-[]		0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K		
Applic	able motor capa	acity	LD	0.75	1.5	2.2	3.0	5.5	7.5	11		
	(kW) *1 ND				0.75	1.5	2.2	3.7	5.5	7.5		
	Rated capacity	(kVA)	LD	1.6	2.7	4.2	5.3	8.5	13.3	17.5		
	*2	` '	ND	1.2	2.0	3.0	4.6	7.2	9.1	13.0		
R	Rated curren	t (A)	LD	2.1 (1.8)	3.5 (3.0)	5.5 (4.7)	6.9 (5.9)	11.1 (9.4)	17.5 (14.9)	23 (19.6)		
	*7		ND	1.6 (1.4)	2.6 (2.2)	4 (3.8)	6 (5.4)	9.5 (8.7)	12	17		
Output	Overload cui	rent	LD		s, 150% 3 ure of 50°0		time chara	acteristics)	at surroun	ding air		
rating *3			ND		s, 200% 3 ure of 50°0		time chara	acteristics)	at surroun	ding air		
	Voltage *4			Three-ph	ase 380 to	480 V						
		Brak	e transistor	Built-in								
	Regenerative braking	100%		50%	20%							
	Rated input A	C voltag	ge/frequency	Three-phase 380 to 480 V 50/60 Hz								
	Permissible A		8 V, 50/60									
_	Permissible fr	±5%										
	Rated input		Without DC reactor	3.3	6.0	8.9	11	16	25	32		
		LD	With DC reactor	2.1	3.5	5.5	6.9	11	18	23		
Power	current (A) *8		Without DC reactor	2.7	4.4	6.7	9.5	14	18	25		
supply		ND	With DC reactor	1.6	2.6	4.0	6.0	9.5	12	17		
			Without DC reactor	2.5	4.5	6.8	8.2	12	19	25		
	Power supply	LD	With DC reactor	1.6	2.7	4.2	5.3	8.5	13	18		
	capacity (kVA) *6	ND	Without DC reactor	2.1	3.4	5.1	7.2	11	14	19		
		ND	With DC reactor	1.2	2.0	3.0	4.6	7.2	9.1	13		
Pi	rotective structu	re (IEC	60529)	Enclosed	type (IP20))						
	Cooling s	ystem		Natural		Forced a	ir					
			1.2					2.4				

- The applicable motor capacity indicated is the maximum capacity applicable for use of the Mitsubishi Electric 4-pole standard efficiency motor. The rated output capacity indicated assumes that the output voltage is 200 V for three-phase 200 V cales and 440 V for the phase 400 V class. The percentage of the overload current rating is the ratio of the overload current to the inverter's rated output current. For repeated duty, allow time for the inverter and motor to return to or below the temperatures under 100% load. The maximum output voltage does not exceed the power supply voltage. The maximum output voltage can be changed within the setting range. The maximum point of the voltage waveform at the
- output slide of the inverter is approximately the power supply volage multiplied by √2.

 The amount of braking torque is the average short-term torque (which varies depending on motor loss) that is generated when a motor decelerates in the shortest time by itself from 60 Hz. It is not continuous regenerative torque. The average deceleration torque becomes lower when a motor decelerates from a frequency higher than the base frequency. The inverter is not equipped with a bulli-in brake resistor. Use an option brake resistor for an operation with large regenerative power (not available for 0.1K and 0.2K). Brake unit (FR-BUZ) can be also used.

 The power supply capacity varies with the value of the power supply is deimpedance (including those of the input reactor actables).

 The value in parentheses is the rated output current when the low acoustic noise operation is performed with the surrounding air temperature exceeding 40°C while 2 kHz or higher value is selected in 2.73 PUMI declarance calculation.

Inverter installation environment

Item	Description	
Surrounding air temperature *1	-20°C to +60°C (The rated current must be reduced at a temperature above 50°C. To meet the UL/EN standards, use the product at temperatures from -20°C to 50°C.)	Enclosure
Ambient humidity	95% RH or less (non-condensing) (With circuit board coating (IEC 60721-3-3 3C2/3S2 compatible)) 90% RH or less (non-condensing) (Without circuit board coating)	Inverter Measurement position
Storage temperature	-40°C to +70°C	5 cm → 5 cm Measurement → 5 cm position
Atmosphere	Indoors (free from corrosive gas, flammable gas, oil mist, dust and dirt)	
Altitude/vibration	Maximum 3000 m, 5.9 m/s ² or less (For installation at an altitude above 1000 m, consider a 3% reduction altitude.)	on in the rated current per 500 m increas

7 APPENDIX

7.1 Instructions for compliance with the EU Directives

- The authorized representative in the EU

 The authorized representative in the EU is shown below.
- Name: Mitsubishi Electric Europe B.V. Address: Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany

- We declare that this inverter conforms with the EMC Directive and affix the CE marking on the inverter.
- EMC Directive: 2014/30/EU Standard: IEC 61800-3:2017 (Category "C3" / Second environment) 2017 (category C3, 2nd environment)
- This inverter is not intended to be used on a low-voltage public network which supplies domestic premises. When using the inverter in a residential area, take appropriate measures and ensure the conformity of the inverter used in the residential area.
- Radio frequency interference is expected if used on such a network.
- The installer shall provide a guide for installation and use, including recommended mitigation devices

- Set the EMC Directive compliant EMC filter to the inverter. Insert line noise filters and ferrite cores to the power and control cables as required.
- Connect the inverter to an earthed power supply.

 Install the motor, EU Directive compliant EMC filter, and controller cable found in the EMC Installation Guidelines (BCN-A21041-204) according to the instructions. (Contact
- your sales representative for the manual.)
 To make full use of the EMC Directive compliant noise filter, motor cable lengths should not exceed 20 m. . Ensure that the finalized system which includes an inverter complies with the EMC Directive

- ♦ Low Voltage Directive
 We have self-confirmed our inverters as products compliant to the Low Voltage Directive and affix the CE marking on the inverters
- Low Voltage Directive: 2014/35/EU Standard: EN 61800-5-1:2007

· Outline of instructions

- Do not use an earth leakage circuit breaker as an electric shock protector without connecting the equipment to the earth. Connect the equipment to the earth (ground)

- Do not use an earth leakage circuit breaker as an electric shock process muscus coursely.

 Wire the earth terminal independently. (Do not connect two or more cables to one terminal.)

 Use the cable whose size is indicated in Section 2.3 at the surrounding air temperature up to 40°C.

 If conditions are different from above, select appropriate wire according to EN 60204.

 Use a tinned (plating should not include zinc) crimping terminal to connect the earth (ground) cable. When tightening the screw, be careful not to damage the threads. For use as a product compliant with the Low Voltage Directive, use PVC cable whose size is indicated in Section 2.3.

 Use the molded case circuit breaker and magnetic contactor which conform to the EN or IECS Standard.

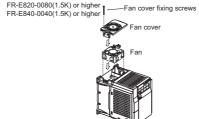
 If an earth leakage circuit breaker is required, use a type-B earth leakage circuit breaker (AC/DC detection compatible).

 Use the inverter under the conditions of overvoltage category III specified in IEC 60664.

 To use the inverter under the conditions of pollution degree 3, install it in the enclosure of IP54 or higher.

 Attach the fan cover to the fan with the fan cover fixing screws enclosed with the inverter.

 FR-E820-0080(1.5K) or higher 1 ——Fan cover fixing screws



If the cover is not fixed, the inverter protective structure is regarded as IP00.

For other information, refer to the FR-E800 Instruction Manual (Connection).

7.2 Instructions for UL and cUL

 Product handling information / Informations sur la manipulation du produit
 -WARNING- Operation of this product requires detailed installation and operation instructions provided in this Safety Guideline and the Instruction Manual (Connection) intended for use with this product. Please forward relevant manuals to the end user. The manuals can also be downloaded in PDF form from the Mitsubishi Electric FA Global Website. To order manuals, please contact your sales representative.

L'utilisation de ce produit nécessite des instructions détaillées d'installation et d'utilisation fournies dans le présent document de la Directive de sécurité et le Manuel d'instructions (Connexion) destiné à être utilisé avec ce produit. Veuillez transmettre les manuels correspondants à l'utilisateur final. Les manuels peuvent également être téléchargés au format PDF sur Mitsubishi Electric FA Global Website. Pour commander des manuels, veuillez contacter votre représentant commercial.

Branch circuit protection

For installation in the United States, branch circuit protection must be provided in accordance with the National Electrical Code and any applicable provincial codes. For installation in Canada, branch circuit protection must be provided in accordance with the Canadian Electrical Code and any applicable provincial codes. Short circuit protection of the inverter cannot be used as branch circuit protection. Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any applicable local codes.

Precautions for opening the branch-circuit protective device /
 Précautions pour ouvrir le dispositif de protection du circuit de dérivation
 -WARNING- If the fuse melts down or the breaker trips on the input side of this product, check for wiring faults (such as short circuits). Identify and remove the cause of melting down or the trip before replacing the fuse or resetting the tripped breaker (or before applying the power to the inverter again).

Si le fusible fond ou si le disjoncteur se déclenche du côté entrée de ce produit, vérifier les défauts de câblage (tels que les courts-circuits). Identifier et éliminer la cause de la fonte ou du déclenchement avant de remplacer le fusible ou de réinitialiser le disjoncteur déclenché (ou avant de remettre sous tension l'onduleur).

Fuse selection

For installation in the United States, the semiconductor fuses shown in the following table must be provided, in accordance with the National Electrical Code and any applicable local codes. For installation in Canada, the semiconductor fuses shown in the following table must be provided, in accordance with the Canadian Electrical Code and any applicable

local codes. The following semiconductor fuses cannot be used as branch circuit protection. For branch circuit protection, use appropriate fuses or install a breaker.											
Inverter model	Cat. No	Manufacturer	Rating		Inverter model	Cat. No	Manufacturer	Rating			
FR-E820-0008(0.1K), 0015(0.2K)	170M1408	Bussmann	700 V, 10 A		FR-E820-0330(7.5K)	170M1419	Bussmann	700 V, 160 A			
FR-E820-0030(0.4K)	170M1409	Bussmann	700 V, 16 A		FR-E840-0016(0.4K)	170M1408	Bussmann	700 V, 10 A			
FR-E820-0050(0.75K)	170M1410	Bussmann	700 V, 20 A		FR-E840-0026(0.75K), 0040(1.5K)	170M1409	Bussmann	700 V, 16 A			
FR-E820-0080(1.5K)	170M1312	Bussmann	700 V, 32 A		FR-E840-0060(2.2K)	170M1312	Bussmann	700 V, 32 A			
FR-E820-0110(2.2K)	170M1414	Bussmann	700 V, 50 A		FR-E840-0095(3.7K)	170M1413	Bussmann	700 V, 40 A			
FR-E820-0175(3.7K)	170M1416	Bussmann	700 V, 80 A		FR-E840-0120(5.5K)	170M1414	Bussmann	700 V, 50 A			
FR-E820-0240(5.5K)	170M1417	Bussmann	700 V, 100 A		FR-E840-0170(7.5K)	170M1416	Bussmann	700 V, 80 A			

♦ Capacitor discharge time / Temps de décharge du condensateur CAUTION - Risk of Electric Shock -

Before wiring or inspection, check that the LED display of the operation panel is OFF. Any person who is involved in wiring or inspection shall wait for 10 minutes or longer after power OFF, and check that there are no residual voltage using a digital multimeter or the like. The capacitor is charged with high voltage for some time after

Avant le câblage ou l'inspection, vérifier que le témoin LED s'éteint. Toute personne impliquée dans le câblage ou l'inspection doit attendre 10 minutes ou plus après la mise hors tension et vérifier l'absence de tension résiduelle à l'aide d'un multimètre numérique ou similaire. Le condensateur est chargé avec une haute tension pendant un certain temps après la mise hors tension, ce qui est dangereux. Précautions pour ouvrir le dispositif de protection du circuit de dérivation

♦ Wiring to the power supply and the motor

Refer to the National Electrical Code (Article 310) regarding the allowable current of the cable. Select the cable size for 125% of the rated current according to the National Electrical Code (Article 430). For wiring the input (RIL1, S/L2, T/L3) and output (U, V, W) terminals of the inverter, use the UL listed copper, stranded wires (rated at 75°C) and round crimp terminals. Crimp the terminals with the crimping tool recommended by the terminal manufacturer.

The following table shows examples when the inverter rating is the LD rating, when the cable is the THHW cable with continuous maximum permissible temperature of 75°C, when the surrounding air temperature is 30°C or less, and the wiring length is 20 m or shorter.

			0-1 4		Cable gauge		
Applicable inverter model	Terminal screw size	Tightening torque (N·m)	Crimp termi	ınaı	AWG		
	· ·	(14 111)	R/L1, S/L2, T/L3	U, V, W	R/L1, S/L2, T/L3	U, V, W	
FR-E820-0008(0.1K) to 0050(0.75K)	M3.5	1.2	2-3.5	2-3.5	14	14	
FR-E820-0080(1.5K)	M4	1.5	3.5-4	2-4	12	14	
FR-E820-0110(2.2K)	M4	1.5	5.5-4	2-4	10	14	
FR-E820-0175(3.7K)	M4	1.5	8-4	5.5-4	8	10	
FR-E820-0240(5.5K)	M5	2.5	8-5	8-5	8	8	
FR-E820-0330(7.5K)	M5	2.5	14-5	8-5	6	8	
FR-E840-0016(0.4K) to 0060(2.2K)	M4	1.5	2-4	2-4	14	14	
FR-E840-0095(3.7K)	M4	1.5	5.5-4	2-4	10	14	
FR-E840-0120(5.5K), 0170(7.5K)	M4	1.5	8-4	5.5-4	8	10	

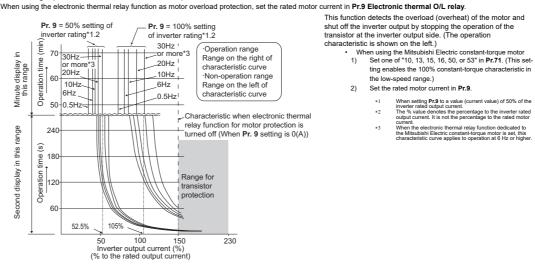
The screw size for terminals R/L1, S/L2, T/L3, U, V, W, PR, P/+, N/-, and P1, and the earthing (grounding) terminal is shown

Short circuit ratings

200 V class: Suitable for use in a circuit capable of delivering not more than 100 kA rms symmetrical amperes, 240 V maximum.

400 V class: Suitable for use in a circuit capable of delivering not more than 100 kA rms symmetrical amperes, 480 Y / 277 V maximum.

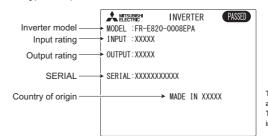
♦ Motor overload protection
The following explains the details of the motor overload protection.



- nulated heat value of the electronic thermal O/L relay is reset to the initial value by the inverter's power reset or reset signal input. Avoid unnecessary reset and power-O Install an extend there are valid to the decorate a function to operate of the trade of part invalid and provided of trades again injust. You and to a great injust, which is a provided of trades again injust. The configuring an external thermal less than the current indicated on the motor rating plate is affected by the line-to-line lessage current. (Refer to the Instruction Manual (Function.)) The cooling effect of the motor drops during low-speed operation. Use a motor with built-in thermal protector. When the difference between the invertee and motor capacities is large and the set value is small, the protective haracteristics of the contractors and the protective characteristics of the contractors are the contractors and the contractors are the contrac electronic thermal relay function will be deteriorated. Use an external thermal relay in such cases
- A dedicated motor cannot be protected by the electronic thermal relay. Use an external thermal relay Motor over temperature sensing is not provided by the drive

SERIAL number check

The SERIAL number can be checked on the inverter rating plate or package



Symbol Year Month Control number SERIAL The SERIAL consists of two symbol, three characters indicating the production year and month, and six characters indicating the control number The last two digits 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

Instructions for EAC

LIIL

tified in compliance with the Eurasian Conformity has the EAC marking.

In 2010, three countries (Russia, Belarus, and Kazakhstan) established a Customs Union for the purposes of revitalizing the economy by forming a large economic bloc by abolishing or reducing tariffs and unifying regulatory procedures for the handling of articles. Products to be distributed over these three countries of the Customs Union must comply with the Customs Union Technical Regulations (CU-TR), and the EAC marking must be affixed to the products

For information on the country of origin, manufacture year and month, and authorized sales representative (importer) in the CU area of this product, refer to the following:

Country of origin indication
 Check the rating plate of the product.
 Example: MADE IN JAPAN

Check the SERIAL number indicated on the rating plate of the product

· Authorized sales representative (importer) in the CU area

The authorized sales representative (importer) in the CU area
The authorized sales representative (importer) in the CU area is shown below.
Name: Misubishi Electric (Russia) LLC
Address: 52, bld 1 Kosmodamianskaya Nab 115054, Moscow, Russia
Phone: +7 (495) 721-2070
Fax: +7 (495) 721-2071

7.5 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. 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

	有害物质 *1									
部件名称 *2	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)				
B路板组件 (包括印刷电路板及其构成的零部件, D电阻、电容、集成电路、连接器等)、电子部件	×	0	×	0	0	0				
2属壳体、金属部件	×	0	0	0	0	0				
 排壳体、树脂部件	0	0	0	0	0	0				
聚丝、电线	0	0	0	0	0	0				

上表依据 ST/T11364 的规定编制。

〇: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。

Referenced Standard (Requirement of Chinese standardized law)

Machinery safety: GB/T 16855.1 GB/T 12668.502

GB 28526 GB/T 12668.3 Electrical safety: GB/T 12668.501

For the retry function

EMC: GB/T 12668.3

7.7 Application of caution labels Caution labels are used to ensure safety during use of Mitsubishi Electric inverters.

Make copies of the following labels and apply them to the inverter if the "retry function" and/or "automatic restart after instantaneous power failure" have been enabled For automatic restart after instantaneous



power failure CAUTION Automatic Restart after Instantaneous Fower
Failure Has Been Selected Stay away from the motor and machine They will start suddenly (after reset

time has elapsed) when

instantaneous power failure occurs.

They will start suddenly (after given time has elapsed) when alarm occurs.